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Ron DeReckless

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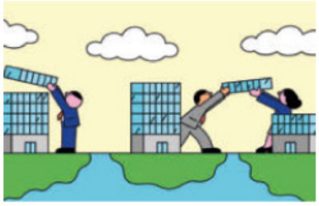

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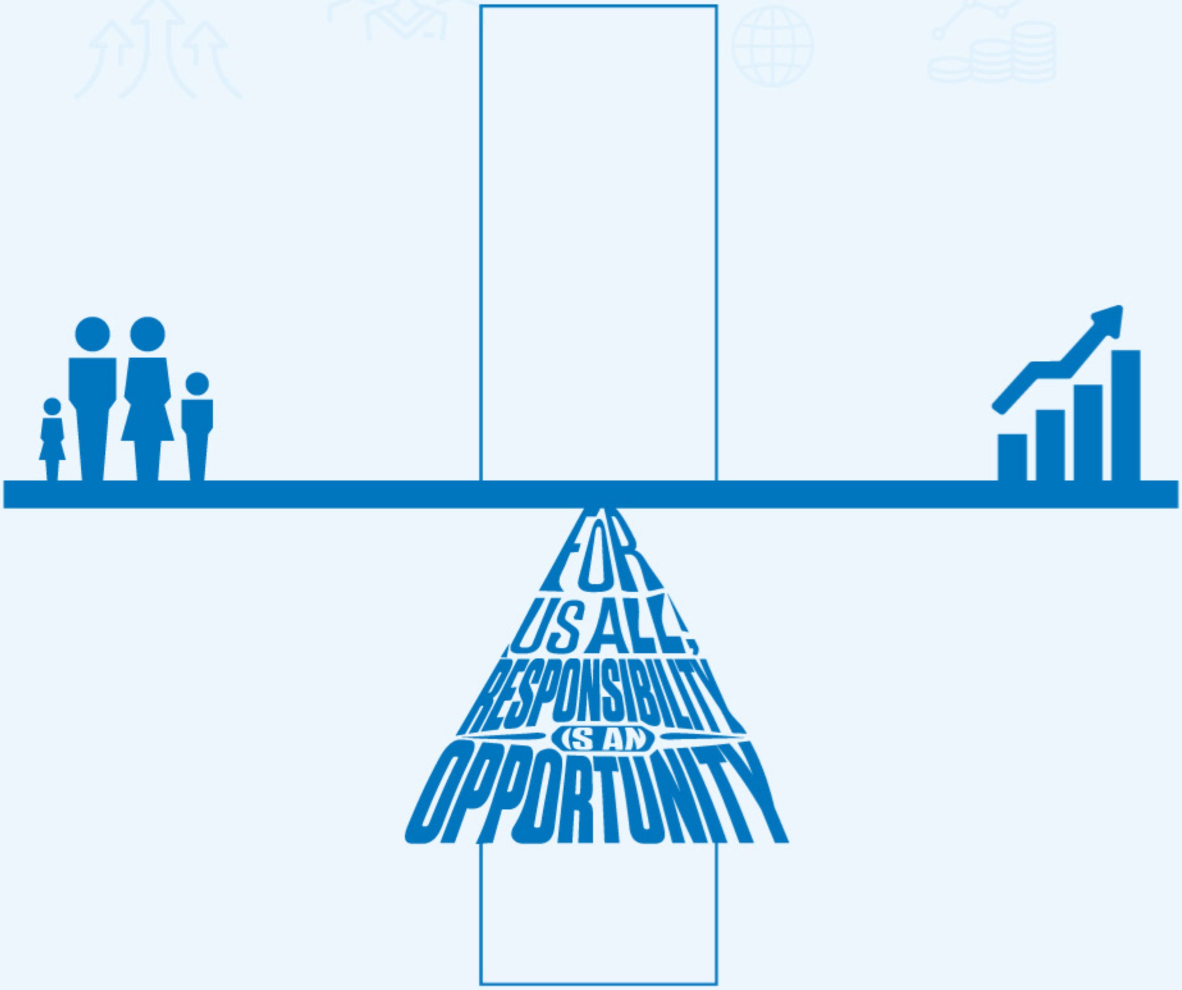
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Anthony Albanese, the prime minister of Australia, and Rishi Sunak, the prime minister of Britain, met Joe Biden, the American president, in San Diego to announce the next stage of the three countries' **AUKUS defence pact**. In a landmark agreement, Britain is to help design and build a new type of submarine for Australia, and America will sell nuclear-powered submarines to Australia in the 2030s. The deal expands the involvement of Britain and Australia in policing the Indo-Pacific. China said the AUKUS countries were travelling down "a dangerous road".

Mr Albanese then went to Fiji to assure it and other **South Pacific countries** that the AUKUS deal does not mean Australia is abandoning its commitment to nuclear non-proliferation. His visit comes as China renews its push for a security pact with nations in the region.

Very cordial

It was also a busy week for Mr Sunak, who met **Emmanuel Macron**, the French president, in Paris. One purpose of their summit was to discuss the surge of illegal migrants crossing to Britain in small boats—Britain pledged money to help build a new detention centre in France. Both said their meeting was a success; Mr Macron described it as "entente renewed". Mr Macron has bristled at the AUKUS pact, though if France ever joins it could become FRAUKUS.

Yoon Suk-yeol visited **Japan**, the first trip to the country by a **South Korean** president for 12 years. His visit follows a recent agreement to compensate victims of Japanese forced labour during the second world war, which had been a sticking point in the two countries' relations. Mr Yoon and Kishida Fumio, the Japanese prime minister, discussed the threat from North Korea, which fired a ballistic missile shortly before the talks.

Police in **Pakistan** tried unsuccessfully to arrest Imran Khan, the country's popular former prime minister, on corruption charges. Mr Khan, a former cricket star who is campaigning for an election due in October, is holed up at his house in Lahore, surrounded by a phalanx of supporters, who forcefully resisted the police's efforts. As Pakistan's economic crisis deepens, many fear a rise in political violence.

China's parliament confirmed Li Qiang as the country's new prime minister. The former Communist Party chief in Shanghai is a protégé of Xi Jinping. He may be more in tune with business than his boss is, but he is expected to be unflinchingly loyal.

An American **Reaper drone** was struck by a Russian fighter jet over international waters in the Black Sea, causing the Americans to down their unmanned aerial vehicle. It was the first military tussle between America and Russia since the start of the Ukraine war. America said the Russians' conduct had been "unsafe and unprofessional".

Hungary's ruling party, the right-wing populist Fidesz, is to delay a session of parliament that will vote on **Finland** and **Sweden** joining **NATO**, even though a Hungarian parliamentary delegation to Sweden said it would back that country's application.

South Africa's president, Cyril Ramaphosa, was cleared by the Public Protector, an anti-corruption watchdog, of attempting to cover up the theft of $580,000 in cash hidden in his sofa. The report will bolster Mr Ramaphosa's political position.

More than 200 people have been killed by flooding and landslides after Cyclone Freddy struck **Malawi** and **Mozambique**. The damage appears to be worse than that caused early last year when another tropical storm destroyed crops and damaged hydroelectric power stations.

Frenemies, again

Iran and **Saudi Arabia** restored diplomatic relations after a seven-year break. The two countries agreed, in a deal brokered by China, to reopen their respective embassies and re-establish formal relations within the next two months. That is unlikely to transform the relationship between the Saudis and the Iranians but it does mark a more public role for Chinese diplomacy in the Middle East.

Hundreds of thousands of people took to the streets of **Israel** to demonstrate against legal reforms put forward by Binyamin Netanyahu, the prime minister. Critics say the reforms would undermine the independence of the judiciary and weaken Israeli democracy. The protests may have been the biggest in Israel's history. Isaac Herzog, the president, tried to reach a compromise by suggesting alternative reforms, but Mr Netanyahu rejected them. Mr Herzog warned of the risk of civil war.

The **Lebanese** lira plunged to 100,000 against the dollar. The currency is officially pegged at 15,000 to the dollar but it hit a new low on the black market. It has now lost 99% of its value since the country's economic crisis began in 2019.

The lower house of **Chile's** Congress rejected a tax reform proposed by Gabriel Boric, the country's left-leaning president. He had hoped that it would raise revenues to help pay for improvements to health care and pensions.

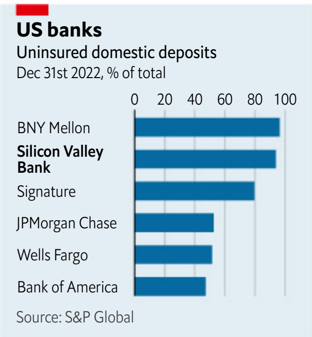
A former cabinet minister in **Ecuador** who had been convicted of corruption escaped from Argentina's embassy in Quito (where she had taken refuge since 2020), causing an almighty row between the two countries. She later turned up at Argentina's embassy in Venezuela.

The president of **Honduras**, Xiomara Castro, said her country would establish diplomatic relations with China, which means it will no longer recognise **Taiwan**. That reduces to 13 the number of countries that recognise Taiwan, a self-governing democracy that China claims as its territory. Seven are in the Americas.

Reported **hate-crime incidents** in America rose by 12% in 2021. Almost 65% of such crimes were related to the race or ethnicity of the victims, 16% to sexual orientation and 14% to religion.

Ron DeSantis, a putative Republican presidential contender, said that supporting Ukraine was not in America's vital interests. He had previously favoured arming Ukraine, but has now moved closer to the foreign-policy stance of Donald Trump. His comments were condemned by the Republican establishment, which will do him no harm among Republican primary voters.

"Everything Everywhere All at Once" dominated the **Oscars**, winning best picture. Its star, Michelle Yeoh, won best actress, the first woman from Asia to capture the award (Ms Yeoh was born in Malaysia).



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The failure of **Silicon Valley Bank**, a mid-sized American lender, sent shock waves through the financial system. SVB specialised in offering banking services to tech start-ups. It got into trouble as interest rates rose, the value of its bond-holdings plunged and nervy depositors took out their money. An attempt to raise capital to plug a shortfall in its finances failed, leading to a run on its deposits and the collapse of its share price. On March 13th HSBC purchased SVB's British assets for £1, but America's regulators have struggled to find a buyer for the rest of the bank.

Two days after SVB imploded regulators took control of Signature Bank, which is based in New York. The speed and the size of the failures rattled **markets**, wiping billions off banking stocks. In a co-ordinated action, the Treasury, the Federal Reserve and the Federal Deposit Insurance Corporation stepped in to protect depositors at both banks and set up a facility that allows banks to tap emergency funds.

The failure of SVB complicates the Fed's path for further monetary tightening. It will now have to weigh up stability in the banking system as well as **inflationary pressures**. The data for February showed annual inflation dropping to 6%, but the core annual rate, which strips out energy and food prices and which economists fret about now, was almost unchanged at 5.5%, and actually rose over January's figure. The **labour market** is also running hot. Employers created 311,000 jobs in February, well above expectations.

In the febrile atmosphere, **Credit Suisse** saw its share price plunge by a quarter when its largest investor, Saudi National Bank, said it would not increase its stake in the business. The troubled Swiss bank had to turn to Switzerland's central bank for support in the market meltdown, and will borrow up to SFr50bn ($54bn) to bolster its liquidity and buy back some of its debt.

Not many countries face inflationary pressures quite like **Argentina**. The official annual inflation rate soared to 102.5% in February, the highest it has been since 1991 and despite price controls on more than 1,700 goods.

Saudi Aramco reported an annual net profit of $161bn. Like others in the oil industry, the company benefited from a buoyant market as demand recovered after the pandemic and prices spiked after Russia invaded Ukraine. It thinks that oil demand will grow again this year, as China reopens and the airline industry recovers.

Underlining **China's** rebound, retail sales grew by 3.5% in the first two months of 2023, year on year, reversing a series of declines towards the end of last year. The statistics bureau warned, however, that the country's economic recovery is "not yet solid".

No jobs in the metaverse

Meta is shedding another 10,000 jobs, which come on top of the 11,000 lay-offs it announced last year. The parent company of Facebook, Instagram and WhatsApp hired too many people during the pandemic and its boss, Mark Zuckerberg, has called 2023 a "year of efficiency". Markets approve. Meta's share price has rebounded from its nadir in November.

OpenAI, the firm behind ChatGPT, released GPT-4, the latest upgrade to the **artificial intelligence** that underlies the chatbot. GPT-4 can accept images as well as text as inputs to generate descriptions and answers.

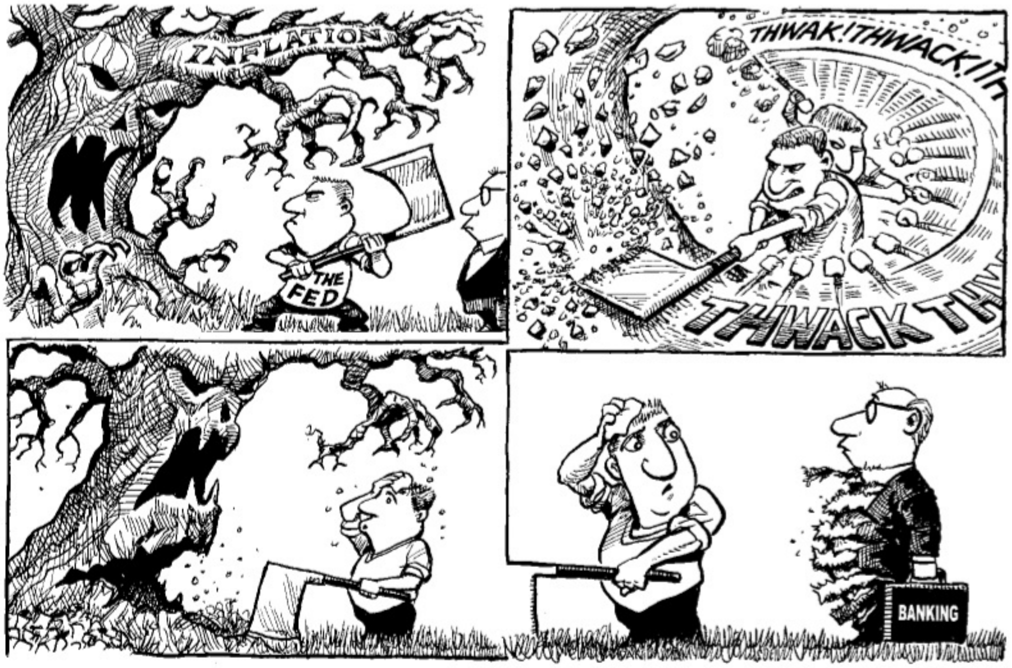
Volkswagen increased the amount of money it is investing in building electric vehicles and batteries over the next five years, to €180bn ($190bn). The investment will also go towards developing software that links smartphones to the cars' functions. The German carmaker has chosen Canada as the home for a new plant that will supply batteries to another new factory, in South Carolina.

Pfizer announced its acquisition of **Seagen**, a biotech company that specialises in cancer medicines. At $43bn, it is the biggest takeover in the drugs industry since 2020.

The global battle for dominance in **chipmaking** intensified, with the news that Samsung Electronics is to spend 300trn won ($230bn) on building five factories near Seoul for advanced semiconductors. The investment forms part of the South Korean government's plan to support 550trn won of private investment in high-tech sectors.

By contrast to South Korea

Britain's economy is doing better than expected and will shrink by just 0.2% this year, according to the government's **budget**; that is an improvement on the contraction of 1.4% previously forecast. Among a series of measures, the budget unveiled a new but temporary regime for capital allowances and more generous child-care support. It also reduced alcohol taxes for pubs. "British ale is warm but the duty on the pint is frozen," said Jeremy Hunt, the chancellor.



What’s wrong with the banks

Rising interest rates have left banks exposed. Time to fix the system—again

Only ten days ago you might have thought that the banks had been fixed after the nightmare of the financial crisis in 2007-09. Now it is clear that they still have the power to cause a heart-stopping scare. A ferocious run at Silicon Valley Bank on March 9th saw $42bn in deposits flee in a day. SVB was just one of three American lenders to collapse in the space of a week. Regulators worked frantically over the weekend to devise a rescue. Even so, customers are asking once again if their money is safe.

Investors have taken fright. Fully $229bn has been wiped off the market value of America’s banks so far this month, a fall of 17%. Treasury yields have tumbled and markets now reckon the Federal Reserve will begin cutting interest rates in the summer. Share prices of banks in Europe and Japan have plunged, too. Credit Suisse, which faces other woes, saw its stock fall by 24% on March 15th and on March 16th it sought liquidity support from the Swiss central bank. Fourteen years since the financial crisis, questions are once again swirling about how fragile banks are, and whether regulators have been caught out.

The high-speed collapse of SVB has cast light on an underappreciated risk within the system. When interest rates were low and asset prices high the Californian bank loaded up on long-term bonds. Then the Fed raised rates at its sharpest pace in four decades, bond prices plunged and the bank was left with huge losses. America’s capital rules do not require most banks to account for the falling price of bonds they plan to hold until they mature. Only very large banks must mark to market all of their bonds that are available to trade. But, as SVB discovered, if a bank wobbles and must sell bonds, unrecognised losses become real.

Across America’s banking system, these unrecognised losses are vast: $620bn at the end of 2022, equivalent to about a third of the combined capital cushions of America’s banks (see Finance & economics section). Fortunately, other banks are much further away from the brink than SVB was. But rising interest rates have left the system vulnerable.

The financial crisis of 2007-09 was the result of reckless lending and a housing bust. Post-crisis regulations therefore sought to limit credit risk and ensure that banks hold assets that will reliably have buyers. They encouraged banks to buy government bonds: nobody, after all, is more creditworthy than Uncle Sam and nothing is easier to sell in a crisis than Treasuries.

Many years of low inflation and interest rates meant that few considered how the banks would suffer if the world changed and longer-term bonds fell in value. This vulnerability only worsened during the pandemic, as deposits flooded into banks and the Fed’s stimulus pumped cash into the system. Many banks used the deposits to buy long-term bonds and government-guaranteed mortgage-backed securities.

You might think that unrealised losses don’t matter. One problem is that the bank has bought the bond with someone else’s money, usually a deposit. Holding a bond to maturity requires matching it with deposits and as rates rise, competition for deposits increases. At the largest banks, like JPMorgan Chase or Bank of America, customers are sticky so rising rates tend to boost their earnings, thanks to floating-rate loans. By contrast, the roughly 4,700 small and mid-sized banks with total assets of $10.5trn have to pay depositors more to stop them taking out their money. That squeezes their margins—which helps explain why some banks’ stock prices have plunged.

The other problem affects banks of all sizes. In a crisis once-loyal depositors could flee, forcing the bank to cover deposit outflows by selling assets. If so, the bank’s losses would crystallise. Its capital cushion might look comforting today, but most of its stuffing would suddenly become an accounting fiction.

That alarming prospect explains why the Fed acted so dramatically last weekend. Since March 12th it has stood ready to make loans secured against banks’ bonds. Whereas it used to impose a haircut on the value of the collateral, it will now offer loans up to the bonds’ face value. With some long-term bonds, this can be more than 50% above market value. Given such largesse, it is all but impossible for the unrealised losses on a bank’s bonds to cause a collapse. And that means that the bank’s depositors have no reason to start a run (see Free exchange).

The Fed is right to lend against good collateral to stop runs. But such easy terms carry a cost. By creating the expectation that the Fed will assume interest-rate risks in a crisis, they encourage banks to behave recklessly. The emergency programme is supposed to last only for a year but, even after it has expired, banks competing for deposits will search for high returns by taking excessive risks. Some depositors, knowing that the Fed has stepped in once, will not have much reason to discriminate between good risks and bad.

Regulators must therefore use the year ahead to make the system safer. One step is to remove many of the odd exemptions that apply to mid-sized banks, some of which were the result of post-crisis rules being rolled back amid much lobbying in 2018 and 2019. The rescue of depositors in SVB demonstrates that policymakers think such banks pose systemic risks. If so, they should face the same accounting and liquidity rules as the megabanks—as they do in Europe—and be required to submit to the Fed plans for their orderly resolution if they fail. In effect, this would force them to increase their safety buffers.

Buffering, please wait

Regulators everywhere must also build a regime that recognises the risks from rising interest rates. A bank with unrealised losses will be at greater risk of failure during a crisis than one without such losses. Yet this disparity is not reflected in capital requirements. One idea is to stress-test what might happen to a bank’s safety cushion were its bond portfolios marked to market, and if rates rose further. Policymakers could then consider whether on this measure the system has enough capital.

Bankers will hate the idea of yet more capital buffers and rulemaking. But the gains from safety are vast. Depositors and taxpayers from Silicon Valley to Switzerland are facing a mighty scare. They should not have to live with the fear and fragility they thought had been consigned to history years ago. ■

Binyamin Netanyahu and a constitutional crisis

Will Bibi break Israel?

When Israel's best and brightest are up in arms it is time to worry

THIS SHOULD have been Israel's moment. As it approaches its 75th birthday in April the risk of a conventional war with neighbouring Arab states, for decades an existential danger, is at its lowest since 1948. The last Palestinian intifada, or uprising against occupation, ended 18 years ago. Israel's tech-powered economy is more successful and globally relevant than ever. Last year GDP per person hit $55,000, making it richer than the EU.

Yet instead of celebrations, Israel faces a crisis. Judicial reforms proposed by the right-wing coalition government would undermine the rule of law and weaken Israeli democracy. The prime minister, Binyamin Netanyahu, who has led Israel for 15 of the past 27 years, prides himself on making ruthless, often ugly, trade-offs that ultimately leave Israel stronger. Now he risks squandering his legacy and leaving Israel less able to cope with the social and geopolitical challenges of the coming decades.

The country is in turmoil (see Middle East & Africa section). On March 11th hundreds of thousands of people took to the streets in what may be Israel's largest-ever protests. Generals, entrepreneurs and scholars warn that democracy is under threat; some 60% of Israelis oppose the legal reforms. Fiery rhetoric from right-wingers, including government ministers, helps fuel violence in the West Bank: so far this year 80 Palestinians have been killed, the highest rate for perhaps two decades.

The struggle may escalate further. The Knesset, or parliament, could pass the legislation in the next couple of weeks. There could be a showdown between it and the Supreme Court, forcing citizens and soldiers to make a painful choice about where their loyalties lie. Ehud Barak, a former prime minister and army chief, has called for mass civil disobedience.

The reforms are a bad solution to a real problem. Israel has no written constitution. For decades, however, the Supreme Court has asserted that some "basic" laws amount to a quasi-constitution it can enforce, overruling the Knesset. Such activism was not clearly understood to be the aim when these basic laws were passed. The right sees a power grab by a lefty judicial establishment. But Mr Netanyahu, who faces corruption charges and detests the legal elite, is imposing a woeful remedy. His reforms would let the Knesset appoint judges and override the Supreme Court, thus handing virtually unchecked power to a slim majority in the single-chamber legislature.

The fight is part of a struggle over Israel's identity, which has become polarised. A far-right fringe has grown, fuelled by Mr Netanyahu's demagogic anti-elite politics, inequality and a bigger number of Jewish settlers in the West Bank. The number of ultra-Orthodox Jews in Israel has grown fast: they are 13% of the population and many study the Torah instead of working or serving in the army. Together, far-right and Orthodox parties won a quarter of Knesset seats in elections last year. With the centre-left parties and Mr Netanyahyu's right-wing Likud unwilling to govern together, he has formed a coalition with them. Moderate Israelis fume that they create the wealth, pay the taxes and fight the wars, in a country that is betraying its liberal roots.

Plenty of other states have survived bouts of populist and divisive rule. Yet Israel is unusually vulnerable. One reason is the economy. With $196bn of foreign reserves, Israel is not about to face a financial collapse. But the core of its economy is technology, which generates over half of its exports. This is powered by spending on research and development which, at 5% of GDP annually, is higher than in any other rich country. The experts and entrepreneurs who make this possible do not relish their country being in thrall to religious fanatics, and could emigrate.

Israel is also vulnerable because it cannot afford to alienate America, which guarantees its security and supplies 80% of its imported arms. Bipartisan support for Israel among Americans is eroding: a majority of Democrats and people aged 18-29 view it unfavourably. Over 90 members of Congress have written to President Joe Biden, objecting to the legal reforms. Meanwhile Iran has enriched uranium to 84% purity and Britain, France and Germany are warning of "the increasingly severe escalation of its nuclear programme". Mr Netanyahu has built links with Sunni Arab states, including via the Abraham accords, in order to form an anti-Iran coalition. But last week Saudi Arabia struck a de-escalation deal with Iran, brokered by China. In a dangerous, unstable region, America remains Israel's indispensable ally.

The final vulnerability concerns Israel's Arab citizens and Palestinians in the West Bank. If minority rights in Israel are weakened, Israeli Arabs, who face discrimination, will grow more disillusioned. And in the West Bank the Supreme Court has to some degree curbed settlements. Weakening the court, even as Israeli ministers openly espouse anti-Arab racism, is incendiary. Mr Netanyahu hopes the Palestinian question can be put on ice for ever. But the Palestinian Authority's biddable 87-year-old boss may not last much longer, and new militant groups are forming.

What is to be done? The legal reforms should be paused. A fitting goal for Israel's 75th anniversary would be a constitutional convention to strike a balance between the courts and parliament and secure broad consent. Divided countries need stronger institutions and safeguards, not weaker ones. Israel also needs a political realignment so that its parties reflect social change. Some 50-60% of Israeli voters are moderate and together they could command a majority in the Knesset. Broad party realignments have happened before.

Promised land

Mr Netanyahu, an MIT-educated, secular pragmatist, is Israel's most consequential politician of the past 25 years, with a big hand in its economic revival and rapprochement with some Arab states. He surely knows that a more restrained government could run Israel better than this one, which relies on extremists. If he could catalyse a new centrist configuration in Israeli politics he would secure his legacy. Alas, his brand is too toxic and he is too bent on self-preservation. His time has passed. To stop Bibi from breaking Israel, moderates must resist his power grab—and press for a government that puts the Middle East's only successful liberal democracy on a less dangerous path. ■

America and Ukraine

Ron DeReckless

Whether or not he meant it, Florida's governor blundered when he said that Ukraine is not a vital American interest

People spout all sorts of nonsense to get themselves elected. Most of the time it does not matter, because memories fade and circumstances change. This week, however, Ron DeSantis, the governor of Florida and the most plausible challenger to Donald Trump for the Republican presidential nomination, declared that Ukraine is not one of America's "vital national interests". He was not only wrong, but his words have done lasting damage to Ukraine, America's allies and America itself.

Mr DeSantis was not speaking off the cuff, but in a prepared answer to a questionnaire put out by Tucker Carlson, a host on Fox News. Describing the war as a "territorial dispute", he argued that America should not become further entangled in Ukraine when it faces so many other tasks, including countering China and securing its own borders. Because Mr Trump has also said that he thinks America has been too generous, it is possible that a Republican victory in 2024 would abandon Ukraine to the invading armies of Vladimir Putin.

Back in 2014 Mr DeSantis favoured arming Ukraine. If his flip-flop is sincere, it is mistaken. The war is not, as he suggests, a local squabble. Mr Putin has made clear that he believes he is fighting NATO over whether Ukraine has the right to determine its own future as a sovereign nation. By defining the war as "territorial", Mr DeSantis is turning his back on the principles America helped build into the UN after the second world war.

Mr DeSantis was also inviting Mr Putin to expand his aggression beyond Ukraine. Mr Putin believes that fickle, inward-looking America will soon tire of protecting Europe and that Russia can profit by helping fill the vacuum it leaves behind. Were Russia to pick off Georgia or Moldova next, and then start testing NATO itself, the peril America faces would be much greater than today. By encouraging Mr Putin in his belief, Mr DeSantis plays into a logic that will put American lives at risk.

And Mr DeSantis is undermining his own priority of standing up to China. If America abandons Ukraine, then Asian countries that depend on America for their security will start to question its reliability. Should they lose faith, some will react by falling in behind China. Others, such as Japan and South Korea, could even procure nuclear weapons. Neither is in American interests.

Perhaps, though, Mr DeSantis's critics are being naive. The governor could be being disingenuous (it has been known). Trailing in the polls, he is desperate not to antagonise Mr Trump's supporters, many of whom are against the war. Mr DeSantis could be leaving himself enough room to shift position and stand by Ukraine if he wins the White House in 2024.

If this is Mr DeSantis's thinking, his campaign tactics come with a price attached. The war is not going well for Mr Putin. His armies are failing to make advances. He is losing men and equipment at an alarming rate. His international support is ragged or opportunistic, but not loyal (see International section). However, because Russia is a nuclear-armed power, the only way to establish a real peace is for Mr Putin, or more likely his successor, to realise that trying to conquer Ukraine is futile.

That is why Mr Putin will take heart from Mr DeSantis's words. Elections in America are 50/50 affairs. If Russia can hang on in Ukraine until November 2024, Mr Putin can reasonably hope that American backing for Ukraine will fade away. Potential dissenters in the Kremlin and the army will be encouraged to hang on, too. And if the conflict should be frozen, Mr Putin will be tempted to think that he can rebuild his armies and attack Ukraine again in the belief that a DeSantis or a Trump White House would stand back.

As governor of Florida, Mr DeSantis has specialised in putting forward policies—such as attacking Disney for its wokeness—that thrill his base and rile liberals, but often have little effect in the real world. On the international stage, reckless words have consequences. ■

Nuclear submarines

In deep

Why the AUKUS pact is a model for Western allies

Australian and British sailors have been visiting American submarines for decades. It would be hard to imagine closer allies than their three countries. But as those sailors approached the engine room they would come to a watertight door that even they could not pass. For beyond it lay one of America's most sacrosanct technologies, shared only with Britain in 1958: nuclear propulsion. The AUKUS pact throws that door open, pointing the way to a new phase in the West's competition with China.

Under the plans announced on March 13th by Anthony Albanese, Joe Biden and Rishi Sunak, the leaders of Australia, America and Britain, Britain will co-design and build a next-generation submarine with Australia (see Asia section). To bridge the gap until the first boat arrives in the 2040s, America and Britain will rotate subs through Perth in the 2020s and America will sell up to five Virginia-class nuclear submarines to Australia in the 2030s. Each of these steps is unprecedented.

The scheme is fraught with risks. The cost to Australia is eye-watering. America is struggling to produce enough subs for its own navy. The project will have to survive the vicissitudes of politics and budgets in all three countries for at least two decades. But that is partly the point. Like-minded leaders have bound themselves and their successors into a long-term commitment ▸▸

not to watch passively as China starts to dominate Asia.

Worries over nuclear proliferation are overblown. The submarines will be nuclear-powered, but not nuclear-armed. Their reactors will contain highly enriched uranium, but it will be supplied to Australia in units that are welded shut. The boats will not need refuelling during their time in service. Even when they are decommissioned, the fuel cannot be used for weapons without processing in facilities that Australia does not have.

The deal has also raised concerns over regional stability. Why, critics ask, is a mid-sized power in the southern Pacific acquiring weapons that can strike thousands of kilometres away near China's coastline? China is not the only country to have raised such objections. On March 14th Malaysia released a statement urging countries to refrain "from any provocation that could potentially trigger an arms race". But the truth is that the arms race started long ago and China has sped ahead.

China's defence budget has been growing at spectacular rates. It now exceeds those of Australia, India and Japan combined. Between 2014 and 2018 alone, China's navy—now the largest in the world—launched warships with a greater total tonnage than the navies of France, Germany or India. It has built 12 nuclear submarines in the past 15 years, and has just announced that it will raise defence spending by around 7% this year. Australia is not the only regional power to be bothered by these trends. Japan, too, has accelerated its re-armament.

Mr Biden should be commended for taking bold steps to shore up Asian alliances at the same time as he provides extraordinary support—$77bn of military and financial aid so far—for Ukraine's war effort. It shows that America need not abandon Europe to deter China as some, like Ron DeSantis, the Republican governor of Florida and a likely candidate for the presidency, seem to think. It is vital that Congress smooths the way for technology-sharing with Australia and Britain, not just for submarines but also for the second "pillar" of AUKUS, which covers emerging technologies like artificial intelligence, quantum navigation and hypersonic missiles.

In a review of foreign and defence policy published on March 13th, Britain described China as an "epoch-defining challenge" that would touch on every region and issue (see Britain section). One recent study of high-impact research papers found that China is the leading country in 37 of 44 key civilian and military technologies, often producing more than five times as much influential research as its closest competitor.

Allies can match that effort only by acting together. AUKUS is therefore a model. It involves a trade-off between sovereignty and capability. America must share its most hallowed secrets, but gains Australian investment in its struggling shipyards, access to more Pacific ports and, ultimately, greater allied firepower in Asia. Australia gets world-class naval technology in exchange for tighter integration with American war plans. All three countries enjoy economies of scale. Their pooling of talent and resources is the way forward. ■

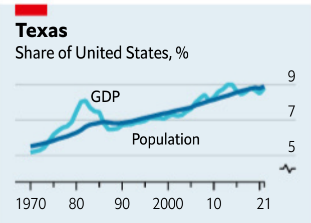
Texas

Lean, mean and surprisingly green

Why America's second-most-populous state matters more than ever

TEXAS KEEPS GETTING bigger. In the year to June 2022 the Lone Star State added 471,000 people, nearly as many as live in Atlanta, Georgia. More than one in three of the net new jobs created in America since February 2020 was created there. A thriving energy industry has helped, but, as our briefing explains, the boom is remarkably broad-based. Sometime in the 2040s, Texas is likely to pass California in population. Like it or not, America is becoming a bit more Texan every day.

With 38 members of Congress and 40 electoral-college votes in 2024 (around 15% of those required to win the presidency), Texas will have a mighty say in national politics. If people and firms continue moving there, as looks likely, Texas will take on an even greater prominence in the American economy. It will also influence how the country navigates its energy transition, because Texas leads not just in oil and gas but also in renewables such as wind and solar. And America's demography will increasingly resemble that of Texas today (where, already, 60% of the population is non-white).


Texas
Share of United States, %

If Texas points to the future, what lessons does it offer? One is that its leaders understood earlier than most that companies and people are mobile. Rick Perry, a former governor, went on "hunting trips" in search of business prey in other states; Greg Abbott, today's governor, has followed suit. Covid-19 highlighted the attractions of a state which was quicker to leave lockdown than many others, such as California, and boasts a cheaper cost of living and fewer restrictions. Texas has offered some incentives to firms, but much of the growth has been down to the lure of a place with no income tax, lots of land for expansion, less red tape and a pro-business attitude. Granted, liberals and moderates abhor the state's shrill, deep-red politics. Mr Abbott courts headlines by, for example, sending busloads of unauthorised immigrants to New York. Such stunts do not seem to have deterred many individuals or companies from moving to Texas, however; it remains to be seen whether recent draconian abortion laws will.

Another lesson from Texas is that nurturing one golden goose is not enough. The oil shock of the 1980s was painful, but the state has since diversified its economy. Finance and property have blossomed. The big cities all have different strengths: tech in Austin, energy in Houston, finance and more in Dallas. Instead of relying solely on oil and gas until the wells run dry, Texas has positioned itself on the cutting edge of new energy technologies (although listening to the rhetoric of the state's politicians, you would not always know it). Places that have only one strong industry should start thinking about how they can use it as a platform to launch the next new thing.

The last lesson, however, is a cautionary one. For much of its history, Texas has had an exceptionally lean government. It has been loth to invest in the people and projects required for the future, including education and roads. Of late, as its formidable growth shows, it has got away with this. But the lean approach almost certainly has its limits, which it would be complacent to ignore. The people moving to Texas have been better educated than native Texans and filled many of the higher-skilled jobs. The state should invest more in its workforce.

The Perot precedent

That is what it did in 1984, when a bill promoted by Ross Perot, a businessman and politician, played a big part in the state's successful economic diversification, by revamping education funding and better preparing Texan students for jobs in industries other than energy and agriculture. Texas today has its biggest two-year surplus ever, worth $33bn (larger than the annual budget of 24 states), so there could be no better time to do something similar for the next stage of the state's development. The debates around culture-war issues are distractions from this task.

Texas is not a blueprint for all of America. It has oil and gas, enabling it to forgo a state income tax. Vast amounts of land help it accommodate companies' expansion. And Texas has plenty of problems. It might be home to more *Fortune* 500 companies than any other state, but it also has the largest number of people who lack health insurance. Its politics have shifted to the extreme right, with rules that curb freedom (such as the abortion ban) and are at odds with the state's traditions of small-government pragmatism (such as its blacklisting of financial firms that boycott hydrocarbons).

Texas's politicians should climb out of the trenches of the culture wars and focus on what the state really needs to secure its prosperity. Astute, targeted investments in its people and infrastructure will help the Lone Star State shine even more brightly. The future of Texas, as with other states, depends on leaders taking the long view. ■

The British economy

Grown-ups and child care

Jeremy Hunt's budget is better at diagnosis than treatment

THE BAR for a successful budget has been dramatically lowered in Britain over the past year. By not blowing up the gilts market on March 15th, Jeremy Hunt, the chancellor of the exchequer, easily bested his predecessor, Kwasi Kwarteng. He managed to talk about tackling Britain's long-run growth problems (see Britain section) without relying on magical thinking about unfunded tax cuts. But Mr Hunt's budget, a little like the man himself, was nonetheless a curious mixture of the reassuring and the unnerving. The country is in much more competent hands with him and Rishi Sunak, the prime minister, at the helm, but its underlying troubles persist.

Start with the reassuring elements. Mr Hunt is taking a far more methodical approach to tackling Britain's problems than happened under Liz Truss and Boris Johnson. Mr Johnson made "levelling up", the ironing out of regional inequalities, into a powerful campaign pitch; Mr Hunt's decision to give two big conurbations in England more control over the money they are given by Whitehall adds substance to that slogan. Ms Truss wanted to cut the ribbon on investment zones everywhere; Mr Hunt plans a more targeted approach focused on high-potential clusters. (His usual language about turning Britain into another Silicon Valley was absent, perhaps because of a bust American bank.)

The chancellor has responded to concerns that crippling tax bills are forcing doctors into early retirement, even if scrapping the lifetime limit on tax-advantaged pension savings for everyone is a bizarrely blunt way to do it. Getting rid of the "work capability assessment", so that people with a disability will have more incentive to work without risking a loss of benefits, is a good idea in principle. Speeding up approvals for medicines, based on the decisions of foreign regulators, is also sensible.

But there is also much to dislike in the budget. Mr Hunt froze fuel duty again, a bad decision that will raise carbon emissions. His desire to encourage business investment and his need to stick to public-borrowing rules led to a dreadful fudge: the introduction of full expensing for plant and equipment spending but only for a three-year period. Britain desperately needs a stable tax regime that spurs investment; the current fiscal framework forces it to make sensible policies temporary. The Office for Budget Responsibility (OBR), a watchdog, duly pronounced that debt would be falling at the end of its five-year forecast period but that capital intensity would not have changed.

Mr Hunt's flagship measure was a big step-up in support for parents of young children: starting in September 2025, the government is promising 30 hours of free child care a week from the age of nine months. This expansion in subsidies is a hostage to fortune: it will only work if the funding is generous enough to make the sums add up for childminders and nurseries. It would have been better to provide the cash directly to parents, who know best exactly what child-care arrangements suit them.

A judgment on the budget depends on the baseline for comparison. Set against the upheavals of the autumn, it is a triumph. The public finances are stable again. The OBR has upgraded its short-term growth forecasts. By restoring competence and normalising relations with the EU, Mr Hunt and Mr Sunak are steadily closing the policy gap with Labour; that will have the salutary effect of forcing the opposition party to be bolder in its own thinking ahead of the next election, which is due by January 2025.

Baby steps

But compare things with 2019, when Mr Johnson won a thumping election victory, and the picture is bleaker. The tax take is forecast to reach a post-war high, even as public services stutter. By 2024 real living standards are set to have fallen by the greatest amount over a two-year period since records began; the OBR says they will still be below their pre-pandemic levels in 2027-28. The country's dismal record on productivity is poised to continue. Mr Hunt and Mr Sunak claim to be problem-solvers. But they have not yet tackled Britain's biggest headaches. ■

Letters

No substitute for exercise

The new obesity drugs covered in your briefing will not curb the obesity pandemic but only fan its fire (“Big shots”, March 4th). Neither the trials that assessed the health consequences of the drugs, nor your article, focused on the impact that they will have on individual and government incentives for obesity control. With a miracle drug at hand, why limit your appetite or work up a sweat through exercise? Governments already hesitant to regulate the obesogenic environment will find that the drugs give them a reason not to tackle the proliferation of ultra-processed fast food and sedentary lifestyles.

The real way to curb obesity is not to focus on treatment but on prevention. Tobacco control has shown the way in regulating unhealthy lifestyles: price increases, limits on sales points, advertising bans and a drastic reduction in the places where smoking is allowed. Businesses that feed obesity are already a multi-billion-dollar industry. With the new drugs, the obesity-treatment industry will become the same. Governments around the world will need the political determination to counter these interests. But societies will gain from controlling obesity. Just as they benefited from tobacco control.

JOCHEN MIERAU
Professor of public health economics
University of Groningen
Groningen, Netherlands

In the 1950s a message of “Smoke, treat, repeat” would have been an inadequate response to ending the health problems from smoking. Your mantra of “Eat, inject, repeat” (March 4th) is similarly misplaced. You did not mention the systemic problems with our food systems, particularly those serving the needs of urban populations.

JONATHAN RUSHTON
Professor of animal health and food systems economics
University of Liverpool

The average person living with obesity needs to lose more than 15-20% of their weight to attain a healthy BMI. These drugs will only help those on the cusp of obesity. Most obese people who use these drugs will remain obese. Serious political engagement with our obesogenic environment is the only way to fix this problem.

DR LUKE ALLEN
GP and clinical research fellow
London School of Hygiene and Tropical Medicine

Studying empires

I pondered over your reviewer’s offhanded dismissal of Nigel Biggar’s observation that other empires were worse than the British version (“The sun never sets”, March 4th). They were, as anyone who has spent time living and working in Africa can attest. In fact, travel isn’t even necessary to reach that conclusion. André Gide’s classic “Travels in the Congo” (1927) and the more recent “King Leopold’s Ghost” by Adam Hochschild provide ample evidence of the horrors of Belgian and French colonialism. As for that other great colonial power, Portugal, it was the last to ban the slave trade, many decades after its continental peers, and partly because of British pressure.

CHRIS HENNEMEYER
International humanitarian consultant
Washington, DC

Stick with Alphabet

The proposition to spin off YouTube from Alphabet presents a compelling argument for investors (Schumpeter, February 25th). However, the decision does not align with the interests of Alphabet or YouTube. You underestimate the complexities involved in dividing the shared hardware and software infrastructure. To function independently YouTube would require a global network of data centres and undersea cables and a separate software stack, which is currently shared with Google. Duplicating, forking and maintaining all of this would require a significant amount of time and resources, allowing competitors to gain an advantage in the meantime.

Furthermore, YouTube and Alphabet have fundamentally different roles. Alphabet is an advertising business that offers a platform on all its properties, upselling YouTube to advertisers who don’t already use it. If YouTube were to become an independent entity it would lose the additional revenue from upselling and would also have to create a sales organisation from scratch. And although YouTube undoubtedly has the potential to grow, it relies on data collected from each consumer to refine its algorithms for content and ads. With less data than before, it would find it a challenge to compete with rivals, such as TikTok.

You suggest that YouTube could focus on subscriptions. However, there is nothing to prevent it from doing so under Alphabet. YouTube Premium already exists.

KRISHNA SUNDARRAM
London

Cleaner air in South Asia

“Choked and gasping” (February 18th) may have been overly pessimistic about the prospects for international co-operation to reduce South Asian air pollution. There are many examples of international collective endeavours dealing with shared environmental problems between geopolitical adversaries (admittedly with mixed success). Long-standing efforts are already in place in such contentious areas as the Mediterranean Sea and the Persian Gulf.

The preconditions for success in reducing pollution include a mobilised transnational scientific community, a strong international institution to co-ordinate national policies and sufficient financial resources to achieve the necessary reductions. Although daunting, these are not impossible to attain, particularly in the South Asian region, where India enjoys many scientific capabilities. The World Bank has also co-ordinated reasonably successful co-operative environmental protection efforts for the Black Sea, although the UN Environment Programme has the greatest experience at organising regional pollution-control efforts.

PETER HAAS
Emeritus professor of political science at the University of Massachusetts Amherst
Florence, Massachusetts

Potential chaos in the Chagos

One has to wonder why Mauritius is so keen to obtain the Chagos Islands, which are half an ocean away from its main island (“Ocean retreat, February 18th). The Seychelles has a better claim, as does the Maldives. Does Mauritius hope to change the current situation, where America and Britain freely share the archipelago? Or is it that Mauritian fishing interests are keen to see an end of the marine protected area, and strict no-fishing zone?

What seems certain is that, even if there are some Chagossians who wish to return to permanent residence in the islands, the Mauritian government has neither the interest, nor the wherewithal to provide the infrastructure (school, hospital, transport) expected of an enlightened colonial power.

SIMON JACKSON
Former commissioner’s representative in the British Indian Ocean Territory
Antibes, France

The new generation

“Gen Zers” as shorthand for Generation Zers is hard on the eyes and harder on the ears (“A new awakening”, February 25th). Please consider using “Zoomers”. Or Zedders?

JAMES HOLGATE
Melbourne

Letters are welcome and should be addressed to the Editor at
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Four fund picks for 2023

Tom Stevenson, Fidelity's Investment Director, reveals the four funds he's chosen for his own investments based on the key trends he expects to see in the markets in 2023

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Each year at around this time I pick a handful of investments from our Select 50. They are funds that I hope will do well in the year ahead. But I pick them with a view to the longer term as well. I see them as good core holdings in a portfolio, not short-term tactical investments.

I expect 2023 will be tough for households and businesses. But my central case is that it could be better for investors. Markets and the economy march to a different beat. And that means it can pay to be optimistic even when the economy is struggling.

A key part of my investment thesis for 2023 is that interest rates will start to fall again as inflation starts to fall back. The peak may be a little higher and later than we hoped but at some point this year the monetary policy tide will turn.

No-one knows what the future holds, so we need to be prepared for the unexpected. But we also need to imagine what could go right. One of the hardest things an investor has to do is to fight the temptation to become more bearish as the market falls.

That's the backdrop to my picks for 2023. A belief that markets will move ahead of the real economy. But a cautious respect for Mr Market too. The journey might not be smooth this year. The bear market may have further to go before it is done. However, I think shares will end the year higher than they began it. And that's why I've selected two global equity funds as my first picks.

1. The Dodge & Cox Worldwide Global Stock Fund

This is a contrarian, value-focused fund. It looks for shares that are out of favour in the short-term, but which have longer-term growth potential. The companies it invests in tend to be medium-sized or large and well-established. And they tend to be cheaper than their peers. Shares in the portfolio are likely to have a higher-than-average dividend yield too.

2. The Edinburgh Worldwide Investment Trust plc

This is a much higher-octane fund and its recent performance shows that investors should be prepared for greater volatility. It invests in smaller companies all over the world, some of which may not yet be listed on public stock markets. Baillie Gifford, which runs this investment trust, looks for mould-breaking companies with high growth potential - entrepreneurial businesses which have the ability to become long-term winners.

This is a risky way to invest, and it is only sensible to do so in a closed vehicle like an investment trust, which can take a longer-term view and avoid being forced to sell investments at the wrong moment. When the market turns up, this investment is likely to outperform more defensive funds. But it is definitely an 'eyes wide open' choice.

3. Colchester Global Bond Fund

Lower interest rates in due course should be a positive for both shares and bonds, so my third pick is a fixed income fund. In particular, I expect government bonds, which are the most sensitive to interest rates, to outperform corporate bonds, which have an element of company-specific risk too.

Colchester is a bond specialist and lends to governments all over the world, but this fund is focused on those in the developed world. I would expect this fund to do well if the economy struggles and investors look out for safer havens.

4. Pyrford Global Total Return Sterling Fund

My final choice is a fund that invests in a range of assets, holding shares, bonds and cash at the same time. It is a contrarian fund which will increase its exposure to stock markets when they fall and shares become cheap. This fund is conservatively run and offers a potentially smoother ride to investors who would prefer to hand over their asset allocation decisions to a professional manager rather than do it themselves.

To find out more or to invest in my 2023 fund picks visit fidelity.co.uk/Tom

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ITU

Call for Expressions of Interest

The International Telecommunication Union (ITU) is the leading United Nations agency for information and communication technologies, with the mission to connect the world.

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For further information concerning the Terms of Reference for the IMAC, the selection process for the candidates and the address to which the application form duly completed in English must be sent, please visit the following website:
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The lodestar state

AUSTIN AND DALLAS

Texas is sucking in people, companies and federal spending

THIS APRIL will mark 45 years since "Dallas", a hit soap opera, first aired. The show, with its greedy oilmen, sun-soaked cattle ranches and lilting drawls, introduced the Lone Star State to the world. But it's not just the big hair and grainy resolution that make "Dallas" seem dated today. It is also the Dallas skyline.

The opening credits showed a cluster of midsized office buildings, within sight of the open prairie. Since these shots were filmed, the skyline has soared and the city has sprawled. There is no open country for miles around. Instead, Dallas and nearby Fort Worth have merged into a "metroplex" of about 7.8m people. From 2010 to 2021 the population of this conurbation grew by 22%—triple the national rate and the fastest pace among America's biggest cities. Its economy grew by 46% over the same period. Dallas-Fort Worth is expected to overtake greater Chicago as the country's third-largest metropolis in the mid-2030s.

And it is not just the area around Dallas that is booming. The population of Texas as a whole grew by 18% from 2010 to 2021. The state's economy grew by 39%, one and a half times faster than the national one (see chart 1, on next page). Employment has been growing even more quickly. From February 2020, just before covid-19 took hold, until the end of last year, Texas gained some 760,000 jobs, an astonishing 35% of the total net increase in employment across the whole of America.

Texas now has more than 30m people. Its GDP is $2trn—bigger than Canada's. It would be the world's ninth-biggest economy if it were independent (which it was for ten years in the 19th century). The state racked up $486bn in exports in 2022, almost a quarter of America's total and more than Taiwan. And only about half of Texas's exports are fossil fuels and chemicals; the state also makes parts for computers and aircraft and much else besides.

Two different buckets of possums

California still has more people than Texas, although, if current trends persist, Texas will eclipse it as the most populous state at some point in the 2040s. California's economy is also huge and fast-growing. But whereas California has been losing residents to other states, Texas is sucking in ever more people from other parts of America, California included. "Texas is what California was in the 1950s and 1960s," says Ken Miller, a professor at Claremont McKenna College in California: an affordable place where people move for jobs and advancement.

The Republicans who run Texas like to crow about these numbers. They consider their business-friendly, small-government conservatism an example for the rest of the country. "If Texas decides to go down a certain pathway, the rest of the United States will go down that pathway," says Greg Abbott, the state's governor since 2015, with the dauntless confidence of a politician on the verge of a run for president. But Texan Republicans have been departing from their own measured script recently, espousing radical positions of the sort that make businesses uneasy. And their devotion to parsimony has caused them to scrimp on investments that are important to the state's future. In the long run, that may curb the growth they trumpet.

Texas has had booms before, in cotton, cattle, timber, railroads and—several times—oil. But its current success is, in effect, four bonanzas at once. The economy is growing thanks to the people flooding into the state, to businesses relocating from other parts of the country, to the energy industry (both green and grubby) and to a swelling tide of federal handouts.

The first boom, in people, is remarkable by any standard. In the 12 months starting in July 2021 Texas added a net 471,000 residents, the most of any state. That is equivalent to 1,290 new Texans each day, or around 9,000 a week. Only a quarter of those came from natural increase (the difference between births and deaths). Another quarter were immigrants from abroad. But roughly half were arrivals from elsewhere in America (see chart 2). Texans, notes Pia Orrenius of the Dallas Federal Reserve Bank, are markedly less likely to move away from their home state than New Yorkers or Californians.

Texas has many attractions. The state government does not levy any income tax. The cost of living is 7.5% below the national average. A big part of that is housing, which is 15% cheaper than the national average. That makes the typical home in Texas 56% cheaper than the equivalent in California. The state generates jobs even faster than it attracts people: employment grew by 28% between 2010 and 2021.

That is in part owing to the second boom, in companies, which are also stampeding into the state. From 2020 to February of this year, at least 139 firms moved their headquarters to Texas, according to YTexas, which tracks corporate relocations to the state. More than 40% of them came from California. Fifty-four of the 500 biggest companies in America by revenue call Texas home, more than any other state. Plenty of firms that are not based in Texas are expanding operations there, too. Goldman Sachs, an investment bank, is expecting its office in Dallas to become its second-largest, after the one in New York City.

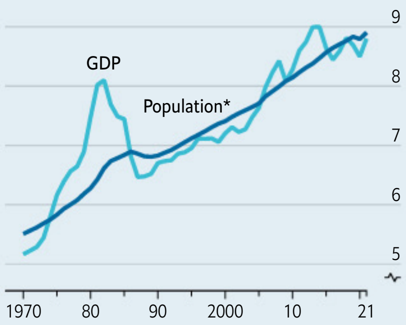
Some footloose firms are looking for an easier place to do business. States in the north-east and on the West Coast tend to have slower permitting, heavier regulation and higher costs. Many kept businesses closed longer during the pandemic. “States that shut down were a great advertisement for Texas,” says Ross Perot junior, chairman of Hillwood, a property firm based in Dallas, and son of the former presidential candidate of the same name.

Small government is not Texas’s only draw, however. Another is its location at the centre of the United States, with excellent transport links to the rest of the Americas by road, rail, air and sea. McLaren, a sports-car company, moved its North American headquarters from Manhattan to Coppell, a suburb of Dallas, last year. Travel to big American and Latin American markets is easier, says Nicholas Brown, head of the firm’s operations in the Americas. Proximity to Dallas-Fort Worth airport, which was the second-busiest in the world in 2021, is also a plus.

Mr Perot, who in expansive Texan fashion enjoys flying helicopters in his spare time, tries to explain Dallas’s appeal from the air. On the north-western outskirts of the metroplex is another, “industrial” airport, where cargo is shunted between planes, trains and lorries. Owned by the city of Fort Worth and managed by a subsidiary of Hillwood, it has become one of the

Everything’s bigger in Texas 1

Texas, % of United States



Sources: US Census Bureau; BEA

*Excl. Puerto Rico

busiest inland ports in the country. Surrounding it is a “mixed-use” development, called Alliance, of 42 square miles (109 square kilometres) which includes shops, restaurants, offices, data centres and even grazing for cattle. This is where Charles Schwab, a financial firm previously based in San Francisco, moved its headquarters in 2021. In total, 560 companies have offices here, employing 66,000 people.

Clusters of industry have sprung up across the state. Finance is concentrated in Dallas-Fort Worth, tech in Austin, energy in Houston and West Texas and manufacturing and aerospace all over the state, including in southern Texas. The diversity of industry and large number of thriving cities acts as a hedge, reducing the chances of a state-wide slump like those created by the oil bust and the savings-and-loan crisis of the 1980s and 1990s, says Mark Jones of Rice University in Houston. Today finance and property account for 18% of Texas’s GDP. Oil and gas, along with associated industries, such as pipelines, refining, petrochemicals and LNG, account for 13-14%, reckons Ray Perryman of the Perryman Group, an economic-analysis firm.

Energy is the source of the third boom. Texas produced 43% of America’s oil and 25% of its natural gas in 2021—far more than any other state. But the story is not simply one of natural endowment. It was in Texas that the practice of “fracking” to release oil from shale beds was pioneered. As a result Texas’s oil production has risen by 360% since 2009.

This growth, and the high prices brought on by Russia’s invasion of Ukraine, have filled the state’s coffers. In the fiscal year that ended on August 31st the state collected $10.8bn in taxes from oil and gas, two-and-a-half times the average of the previous decade. That, in turn, contributed to a record $33bn surplus.

Texas is also a leader in green energy. It produces more wind power than any other state, and over the past two years has led the country in solar installations, adding 6.3 gigawatts of solar farms, 85% more than California. Next year the share of renewables in Texas’s power mix is expected to surpass natural gas for the first time, according to the US Energy Information Administration. “People used to think that Texas was the last place where the energy transition was going to happen,” says Brett Perlman of the Centre for Houston’s Future, a think-tank. But a “green rush” is afoot in Texas, he says, aided in part by federal subsidies for clean energy.

Lard without boiling the hog

That is the fourth boom: all the money raining down from Washington, DC. Like most states, Texas received federal transfers intended to stimulate the economy during the pandemic: a whopping $300bn of them. Glenn Hegar, Texas’s comptroller (akin to treasurer), compares the experience to a film in which the protagonist receives “an adrenalin shot to the chest” and wakes with a start.

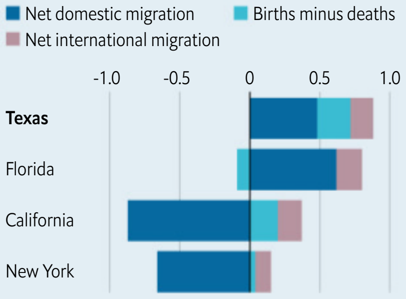
Three more recent federal laws are now adding to the largesse. The Inflation Reduction Act, which aims to reduce carbon emissions, will bring an estimated $66.5bn to Texas for clean-energy projects by 2030. The Infrastructure Investment and Jobs Act, which focuses on transport and broadband, will ladle on a further $27.5bn over the next five years. The $52bn CHIPS Act, passed in July and designed to boost the domestic production of semiconductors, provides huge incentives that will benefit Texas. Even before it became law, Samsung and Texas Instruments had announced plans to spend $17bn and $30bn respectively building factories in the state.

Can the bonanza last? Inevitably, the fire hose of federal money will at some point lose pressure. Energy prices, too, tend to gyrate. But Texas has many lasting advantages. Its young, growing population is a boon. So are its wide-open spaces. It is the second-biggest state by area, after Alaska. The city of Fort Worth, just one slice of the metroplex, has an area of 350 square miles, points out Mattie Parker, its mayor. That is bigger than the five boroughs of

Home on the range 2

United States, change in state population, m

April 1st 2020-July 1st 2022



Source: US Census Bureau

New York City, but with barely a tenth of the population. And unlike New York, which is hemmed in by water, Fort Worth sits in flat grassland.

Several things could yet trip Texas up, however. One is its own success. As more people have arrived, it has become more expensive, somewhat eroding the advantage of its low costs. Austin, the capital, is seen as a cautionary tale. As tech companies have flocked there, they have brought some of San Francisco's problems with them. Home values have surged by over 50% more than the national average since 2010. In part, that is because the city has become more hostile to development, slowing the construction of new roads and houses. Although Austin remains an outlier, such problems could proliferate.

Another question is whether Texas will make the investments required for long-term success. The state's leaders are proudly stingy and government-phobic. The legislature meets for 140 days every other year, far less than in most states, yet wags joke that Texans would prefer them to meet for two days every 140 years. The lack of a state income tax lends itself to bare-bones budgets. That, in turn, constrains spending on infrastructure. Underinvestment in the electric grid, for instance, contributed to its harrowing failure during the "snowpocalypse" of 2021.

The state is especially stingy when it comes to investing in people. It refuses to expand state-funded health care for the poor, even though the federal government pays 90% of the cost. That leaves Texas with the largest uninsured population in the country. "I am sceptical of the long-run booming times in Texas, if we don't find a way to invest in the people of Texas," says Stephen Klineberg of Rice University's Kinder Institute for Urban Research.

Texas's public-education system is also poor in both funding and results. The state spends $10,741 per student, putting it 42nd out of the 50 states. Margaret Spellings, a former national secretary of education, who now heads Texas 2036, a think-tank, says she would give Texan schools a "C-minus" if she had to grade them. Only 38% of fourth-graders (aged nine and ten) meet the required standard in maths and less than 30% of them in reading. The state's relative performance in education has recently improved, but that may be because other states were slower to reopen schools during the pandemic. "We are crawling out of the basement," says Ms Spellings.

That is alarming, given that about a tenth of American public-school pupils are in Texas. By 2036 over 70% of the state's jobs will require a credential beyond a high-school diploma, predicts Texas 2036, yet only 22% of pupils currently earn one within six years of high-school graduation.

Demography compounds the need for greater investment in education. From 2010 to 2020 the number of white Texans under the age of 18 fell by 43%. But the overall number of under-18s grew by 413,000 because of a surge in the numbers of Hispanic and African-American children. Children from these groups, however, are far more likely to live in poverty. Their prospects for advancement hinge on the quality of their education.

Recently Texas has been investing more in education and experimenting with innovative programmes that pay good teachers who work in struggling schools more and reward school districts for producing pupils who go on to further education. Today about half of teachers and pupils are in districts with performance-based pay, up from less than 5% in 2019, notes Todd Williams of Commit Partnership, an educational charity. He says the state is "getting serious about making sure that our own kids get to participate in the prosperity of Texas versus continuing to rely heavily on filling jobs from out of state".

The state's $33bn surplus could help fix this. But only a portion of the "once-in-a-lifetime opportunity", as Mr Hegar, the comptroller, calls it, will go to education. Instead, legislators want to use funds from the existing budget to send children to private schools through a voucher scheme. The governor also wants to cut property taxes, although that does little to help poor Texans, who tend not to own their homes.

Populist politics are another potential stumbling block. The state used to have a reputation for moderation. Recently, however, Mr Abbott and other prominent politicians have adopted more extreme policies, in an effort to fend off primary challenges. (They assume the leftward shift of the national Democratic Party and a lack of good candidates in Texas will protect them in the general election.) The previous legislative session, in 2021, was the most conservative in decades, approving laws to allow guns to be carried without any permit and banning abortion from the moment a fetal heartbeat can be detected, with no exceptions for rape or incest.

Don't squat with your spurs on

Although they pride themselves on their *laissez-faire* approach to regulation, Texan politicians are also starting to interfere in companies' decisions. They have banned any firm that has blacklisted gunmakers from doing business with the state. Ditto financial firms that have staked out "environmental, social and governance" policies that seek to limit investment in oil and gas. "We will discriminate back against those discriminating against our oil and gas firms," says Mr Abbott, adding that "BlackRock is blackballed in Texas."

This fixation with cultural controversies is a distraction from the state's real needs. "The business sector doesn't want to see state government obsessed with scoring highly partisan points on hot-button identity-politics issues; they want to see long-term problem-solving on road infrastructure, water infrastructure, the research facilities and schools of the future," says Cullum Clark of the Bush Institute-Southern Methodist University Economic Growth Initiative. After the restrictive abortion law came into effect, some tech companies saw a fall in the number of engineers and executives willing to relocate to Austin from California.

None of these potential problems is likely to derail the Texan economy, however. Mark Cuban, a businessman based in Dallas who stars on the television show "Shark Tank", says he has heard "not a single conversation about anyone moving out". The question, rather, is whether the state makes the most of its quadruple boom. "Don't mess with Texas", runs a popular slogan found on bumper stickers and T-shirts all over the state. Its politicians should take heed. ■

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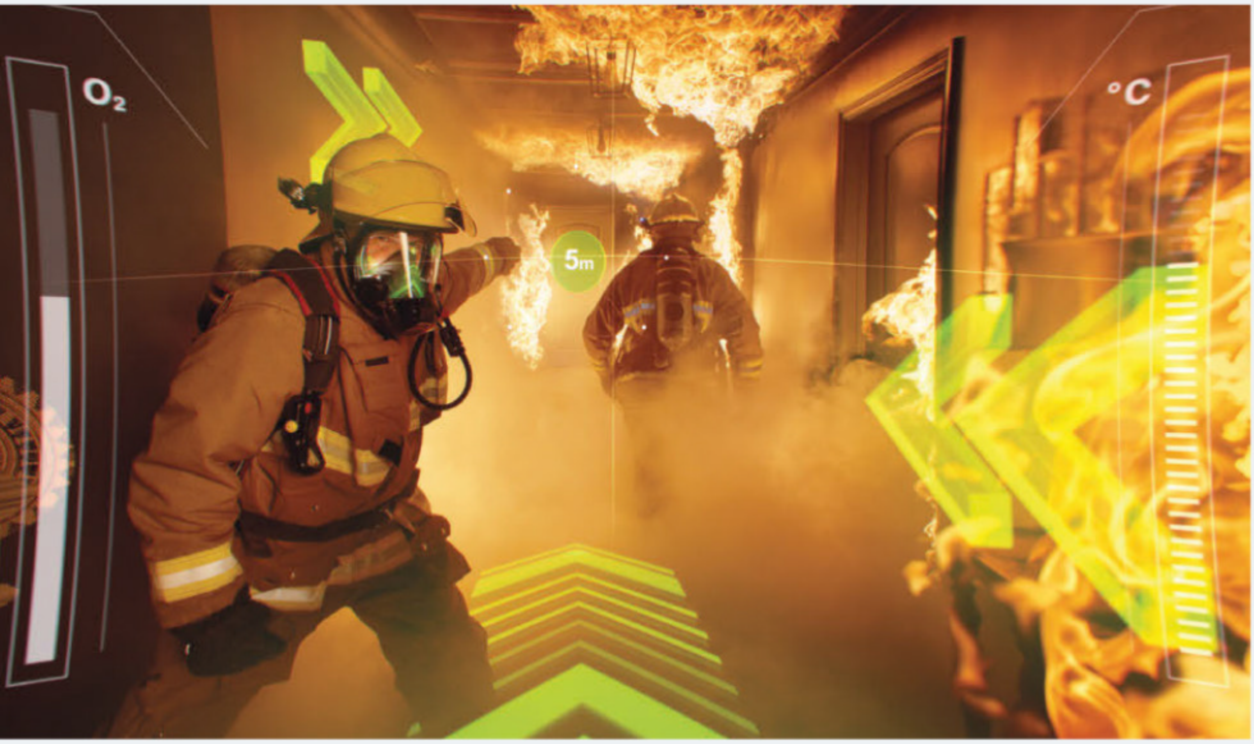

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The budget

Treasury island

Will the chancellor's "budget for growth" achieve its goal?

Jeremy Hunt, the chancellor of the exchequer, started his budget speech to Parliament on March 15th by hailing improvements to Britain's growth forecasts. Thanks to better global conditions and the government's own economic policy the country would, he said, manage to avoid a technical recession in 2023 (defined as two consecutive quarters of contraction). Later Mr Hunt ran through the actual forecasts from the Office for Budget Responsibility (OBR), a fiscal watchdog: Britain's economy would shrink by 0.2% in 2023 instead of the 1.4% contraction that it had predicted in November (see chart on next page).

That sense—of low expectations being surpassed—infused Mr Hunt's budget. Compared with the disastrous "mini-budget" delivered by his predecessor, Kwasi Kwarteng, in September 2022, this was a sober and sensible affair. Gilt yields, the cost of government borrowing, fell during the speech (although that was more owing to concerns over the health of European banks than any news from Parliament).

The message to restive investors was clear: there would be no more nasty surprises from a British chancellor. Most policy measures had been trailed in advance through leaks to the press. The OBR, which had been notoriously sidelined by Mr Kwarteng, judged that Mr Hunt would narrowly meet his fiscal target of debt falling as a share of national income in five years.

Such fiscal rectitude came despite tax cuts and spending increases. Mr Hunt announced an extension of the energy-price guarantee, a subsidy that keeps annual household energy bills at around £2,500 ($3,020) for a typical family; tax-free childcare support for those with children between the ages of nine months and two years; and a change to investment allowances enabling large companies to offset all their capital spending on plant and equipment against their tax bill. He also abolished the cap on the lifetime amount that workers could save for their pensions before paying additional tax; and, finally, announced another freeze in the level of taxes levied on car fuel. In total the bill amounted to £20bn a year for the next three years, according to the OBR.

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27 State schools and Oxbridge

28 Bagehot: Crime in plain sight

Mr Hunt managed to square the circle thanks to a mix of those improved official growth forecasts and his own fiscal sleight of hand. The OBR itself handed the chancellor a windfall owing to what it labelled a brightening economic outlook. As well as higher growth this year and next, the watchdog judged that inflation would fall more quickly and the cost of government borrowing would not rise as much as it had expected in November. These changes to the forecast raised the amount the chancellor could spend by £24.6bn.

The trickery was to present as temporary tax cuts that are very likely to be extended. Freezing fuel duty, for example, will cost the exchequer just under £5bn next fiscal year; the levy is ostensibly set to rise after that. But Tory chancellors have promised to increase fuel duty the next

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18+

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year ever since the party took office in 2010. Not one ever has, at a total cost to the public purse of around £80bn.

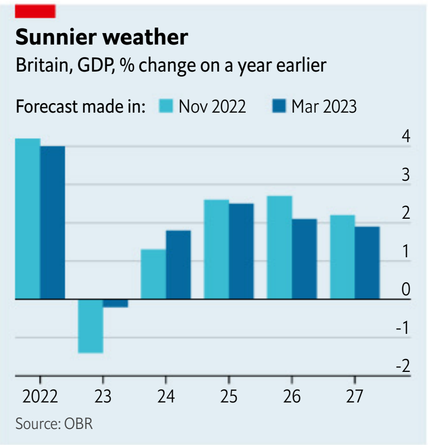
In the same vein Mr Hunt made the change to corporate investment allowances temporary (while expressing the hope that this measure would eventually become permanent). The tax break is due to last for only three years—ensuring that he meets a fiscal rule of having debt falling within the fifth year of a rolling five-year period. Mr Hunt can, if he wishes, announce yearly extensions of the scheme.

Such chicanery will, however, also reduce the benefits of the policy. Mr Hunt billed his plan as a "budget for growth". The OBR judged him correct. Its number-crunchers estimated that Mr Hunt's measures would raise economic growth by around 0.2% of GDP in 2027-28, by boosting investment through tax breaks in the next few years and the labour supply when the new child-care measures properly kick in. That would lower borrowing by £3bn in the next fiscal year and £1.7bn further out, offsetting some of the policies' cost.

Yet this additional growth will not come from higher productivity, the missing ingredient in the British economy. The OBR forecast that the temporary increase in investment allowances will change only the timing of capital spending and not the amount: in other words, high investment over the next three years will be offset by lower spending after that. The amount of capital per worker and, therefore, productivity will remain unchanged. It was the latest example of chancellors tweaking Britain's corporation-tax system, said Paul Johnson, director of the Institute for Fiscal Studies, a think-tank. "There's no stability, no certainty and no sense of a wider plan."

Instead, the improvements in Britain's long-term growth outlook stem from expectations of greater labour supply. The biggest boost is owing to migration. The OBR has, again, revised up its estimate of how many immigrants would come to work in Britain following the country's departure from the EU. Net migration is forecast to add around 160,000 more workers. Of the 110,000 increase in the number of British workers that the OBR attributes to the budget, about 75,000 are thanks to the child-care changes (that may be a stretch). The watchdog reckons the remainder will be either prodded or tempted to find jobs by changes to benefit entitlements, more generous pension allowances or schemes to help the long-term sick into work.

Such policies may be worthwhile, but their benefits can also be overstated. Parents of young children are already providing valuable services by taking care of them, for example, even if they are not paid and therefore not counted in economic output. Others are very expensive. Roughly 15,000 workers are predicted to stay in the labour force thanks to the changes to pension taxation, at an annual cost to the exchequer of £56,000 each by the end of the forecast period. The Labour party has pledged to reverse this measure if elected, potentially muting its effect.



Sunnier weather

Britain, GDP, % change on a year earlier

Source: OBR

Nor did the budget provide much for Britain's struggling public services, particularly the health-care system, which has been blamed for a rise in the ranks of those dropping out of the labour force owing to ill health. Mr Hunt has surpassed low expectations. Next he needs to raise them. ■

Employment

Not child's play

NEW ROMNEY

The chancellor hopes more child care will get more parents working

SPACE IS TIGHT in Lisa Evans's office, but there's enough for the important stuff. Bags of chocolate eggs are perched on a cardboard box, ready for daily hunts in the run-up to Easter. At Abacus Nursery and Childcare in New Romney, a pebble's throw from the Kent coast, the rooms where children play and learn are light and airy. But the register is as full as the manager's cubbyhole. Though Abacus can take 60 children at a time, during the day and in breakfast and after-school clubs, few slots are left for this coming September.

Even as Jeremy Hunt presented his budget on March 15th, parents were asking Abacus about more hours. The chancellor unveiled a big expansion of "free" (ie, government-funded) child care, hoping to coax more parents (especially mothers) back into work. The government will, in effect, be setting the price of around 80% of pre-school care, calculates the Institute for Fiscal Studies (IFS), a think-tank, up from just under half now. But whether nurseries and childminders—who look after small groups, usually in their own homes—can meet the surge is open to doubt.

From September 2025 working parents will be entitled to 30 hours' state-funded child care a week, for the equivalent of 38 weeks a year, once their child reaches just nine months of age. (Mr Hunt is starting by giving two-year-olds 15 funded hours from April 2024.) Currently only working parents of three- and four-year-olds are eligible for so much. All parents of three- and four-year-olds can have 15 paid-for hours, as can the most disadvantaged—roughly 40%—of those with two-year-olds. Parents pay for additional hours, and often for lunches and other extras.

The chancellor is also lifting the cap on help for those parents on universal credit, the main working-age benefit, who buy extra hours—from £646 ($780) for one child and £1,108 for two or more, where it has been stuck for years, to £951 and £1,630 respectively. They will also be able to claim in advance, rather than wait for weeks, which they can ill afford.

The Office for Budget Responsibility, a watchdog, estimates that of all Mr Hunt's measures, the extension of 30-hour child care will provide the biggest boost to economic output. It expects an extra 60,000 people to work an average of 16 hours a week by 2027-28, plus an equivalent effect from those already in jobs putting in more hours. Raising the universal-credit cap lifts employment by another 15,000.

That may be over-optimistic. It is hard to know how many parents of very young children will simply prefer to look after them. So is predicting whether there will be enough child-care places. Although Ofsted, the education regulator, says the total number has been pretty constant in recent years, many childminders, especially, have shut up shop. Providers say the hourly rate for "free" hours falls well short of their costs, as wages (around three-quarters of their expenses) and energy prices have risen. They make up the shortfall by charging more for additional hours: in New Romney, Ms Evans will raise prices after Easter. Extending free hours will reduce the scope for that kind of thing.

Mr Hunt is trying to woo childminders back, offering them a £600 bounty. He is also raising providers' hourly rate for 2023-24 and 2024-25. That, estimates Christine Farquharson of the IFS, covers expected rises in wages and other providers' costs, but not the 13% cut in real funding since 2017-18 (after adjusting by a sector-specific price index). The government is also relaxing the minimum ratio of staff to children, though to some that means cutting corners as well as costs. "Fewer staff means less quality," says Ms Evans. If the measures in the budget do not tempt more providers into the sector, Britain's child-care squeeze may get even tighter. ■

Climate v car

A bridge too far

MENAI BRIDGE

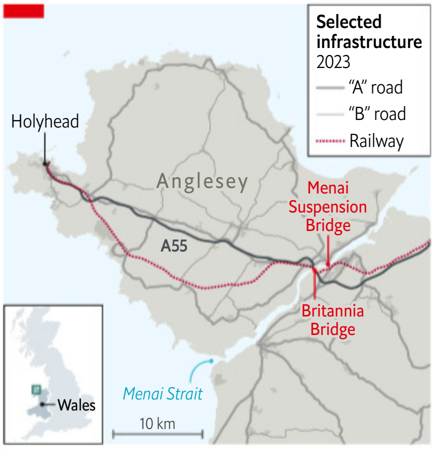
In the name of the planet, Wales curtails roadbuilding

Trouble over bridged waters

THE 21ST century is a strain on two wonders of the 19th. Thomas Telford's suspension bridge over the narrow Menai Strait, between Anglesey and the Welsh mainland, was the biggest of its kind when completed in 1826. When it was shut for repairs between October and February, cars clogged the bigger Britannia Bridge, a little to the west, which was opened in 1850 and carries both rail and road traffic. The Britannia Bridge anyway gets congested at peak times—so much so that in 2018 the Welsh government (then a Labour-led coalition) promised a third road bridge.

Last month the Welsh government (now Labour alone) accepted an expert panel's recommendation that this scheme and 30 other road projects be shelved. The projects have fallen foul of a climate-friendly, car-hostile transport policy introduced in 2021, plus a lack of cash. Ministers want car mileage per person in 2030 to be 10% lower than in 2019, and journeys shifted to "sustainable modes"—trains, buses, bikes and walking. A shift to electric vehicles will help, the panel says, but will not be enough. Scotland has a more demanding target, of a 20% cut in total mileage by 2030; England has no such national target. The Welsh decision raises a simple question: when is it OK to build a road?

The panel's conclusion is that there are just four acceptable answers: shifting trips to sustainable modes (eg, building separate cycleways or access for buses to railway stations); reducing casualties; adapting to climate change; and access to new developments with plenty of sustainable transport. Moreover, schemes should not increase road capacity for cars, allow higher speeds and hence more emissions, or damage ecologically valuable sites. Emissions due to construction should be minimised. The third Menai crossing would have meant a boost to traffic, of 10-12% by 2038, and wreckage of ancient woodland.



Some fear that curbing road-building will put the brakes on the economy. Andrew Davies, the Conservative leader in the Senedd, or Welsh Parliament, says ministers have "put a 'closed for business' sign on Offa's Dyke". It's not as if the transport system is fit for the 21st century already, he adds. Even some Labour politicians are vexed by the chopping of schemes in the north-east, around Wrexham and on the A55 in industrial Deeside.

The economic case for more tarmac is not always robust: the panel pointed out that the expected benefits of some proposed schemes fell short of their costs. But it also argued, in essence, that the government's climate-friendly policy reduces their expected benefits, most of which came from the value of time saved on quicker journeys. If other means of transport are available and fewer cars are on the road, those gains shrink.

That is a big if. The Welsh government has plans to boost the alternatives to cars. It intends to oversee closer integration, from tickets to timetables, of different forms of public transport—which is lacking all over Britain. Buses on demand have been deployed in some areas. In south-east Wales a commission led by Terry Burns, an economist and former head of the Treasury, made dozens of recommendations in 2020, including new railway stations and improved cycleways, in order to shift traffic off the M4 motorway. Implementation plans are in hand.

A similar body, also chaired by Lord Burns, has been set up for north Wales. In a progress report in January it noted the dominance of the car, from the rural north-west to the more urban north-east, where industrial estates "have been designed with vehicles at their centre". A "major shift in the public transport services" will be needed to cut car use. Among much else, that means better buses in the north-west, where frequent services are rare even at peak times, and better rail services in the north-east. Some schemes are already under way, but there is an awful lot to do.

Lord Burns's remit includes the Menai Strait, where a new but greener crossing may yet happen. Rhun ap Iorwerth of Plaid Cymru, the Welsh-nationalist party, who represents Anglesey in the Senedd, says he anyway preferred a "simpler" option: adding a two-lane structure next to the Britannia Bridge, which would provide cycle lanes and walkways.

A more robust link to the mainland might be valuable for a proposed freeport near Holyhead, at the former home of Anglesey Aluminium, which closed for good in 2013, and for a putative modular nuclear reactor at Wylfa, where an atomic power station shut in 2015. The island could do with investment: a poultry factory employing more than 700 is to close. The point of the third crossing isn't relieving congestion, says Mr ap Iorwerth. "It's about resilience. We don't want to be isolated." ■

The integrated review

What place in the world?

Britain takes a fresh look at its foreign and defence policies

IN MARCH 2021 the British government published a sweeping review of foreign, defence, development and security policies dubbed the "Integrated Review". The world was becoming more competitive and fragmented, it warned. Just how much so it could not have guessed. That summer Kabul fell to the Taliban. A few months later Russia invaded Ukraine. Sino-American relations appear to be in free fall. On March 13th the government accordingly gave the review an update.

The new report tackles two of the criticisms levelled against the original. One was that it had a Europe-shaped hole. At the time, Boris Johnson, then prime minister, was waging diplomatic trench warfare with the EU. Rishi Sunak, the current prime minister, has achieved an armistice by signing the "Windsor framework", a deal over the arrangements for Northern Ireland, and soothing relations with France.

The second gripe was that Mr Johnson's "tilt" to the Indo-Pacific region was boosterish folly, not least after Russian tanks ▸▸

had rolled into Ukraine. But the review declares the tilt a success, largely owing to non-military instruments such as trade and diplomacy. The policy looks more substantial than it once did. In December Japan signed up to an Anglo-Italian initiative to build a next-generation warplane, a project known as GCAP. And on March 13th it emerged that Britain would co-design a nuclear submarine with Australia as part of the AUKUS pact, a three-way deal announced by America, Australia and Britain 18 months ago. On top of that, Britain is also close to being accepted as a member of the CPTPP, an Asian trade deal.

The review, led by John Bew, a professor brought into Downing Street by Mr Johnson and kept on since, deftly weaves together these two strands of British foreign policy. "The prosperity and security of the Euro-Atlantic and Indo-Pacific are inextricably linked," it argues. It points to growing co-operation between European and Asian powers, including not just GCAP and AUKUS but also a promise to establish a "permanent" maritime presence in the Indo-Pacific with France. It also emphasises China's "epoch-defining challenge" to the world order, and promises to double funding for "China capabilities", such as language skills in government.

The document's tone is sober, often gloomy. "The transition into a multipolar, fragmented and contested world has happened more quickly and definitively than anticipated," it acknowledges. "The risk of escalation is greater than at any time in decades." China and Russia, growing closer, are among the authoritarian powers working "to undermine the international system or remake it in their image". Protecting that system, it warns, requires co-operation not just with Western liberal democracies, but all sorts of "middle-ground" powers—think Brazil, India, Saudi Arabia and Turkey—who reject the idea of joining either an American or Chinese bloc.

The report avoids bombastic talk of Britain as a superpower. The phrase "Global Britain", a favoured slogan under Mr Johnson, has been exiled. But it recognises British strengths, notably in science and technology, and the need to build economic resilience in areas from artificial intelligence to semiconductors. A new government-industry task force will focus on bolstering British capability in AI "foundation models", similar to ChatGPT.

As with the first review, the biggest question is whether Britain has the resources to realise the vision. The ambition to co-ordinate the various levers of power, from offensive cyber capabilities to sanctions, "is a terrific goal," says an official who was involved in the last review, "but is there yet a properly integrated machinery—and human capital—to do all this?"

Defence spending is a particular bone of contention. On March 13th, two days ahead of the budget, the British government said it would give an additional £5bn to the Ministry of Defence over the next two years. All of that will be absorbed by nuclear weapons, submarines and the replenishment of munition stockpiles run low by the war in Ukraine. Instead of pledging to spend 2.5% of GDP on defence, as military chiefs had wanted, the review says that this is only an "aspiration...as fiscal and economic circumstances allow".

If the core defence budget were indeed to rise to that level over a decade, that would mean a 40% rise in spending, with accompanying tax rises, says Malcolm Chalmers of the Royal United Services Institute, a think-tank. "The government has left this tricky dilemma to its successor," he suggests. In opinion polls, the Labour Party holds a commanding lead of more than 20 points over the Tories. The next election is due by January 2025.

Despite harsh public criticism of the government's failings over foreign and defence policy, Labour is aligned with the official Ukraine policy, supportive of schemes like GCAP and AUKUS, and similarly sceptical of China. It would preserve much of this strategic vision. Even so, John Healey, Labour's shadow defence secretary, says that he would hold a fresh review in his first year in office. Events will surely have changed the picture again by then. ■

Saunas

Hot new trend

Fetch the birch, waft the towels

Steamy stuff

A NAKED MAN sits at a poker table, playing cards held close to his chest. He has just been downstairs in the *banya*, a Russian kind of sauna. The New Docklands Russian Banya & Steam Baths in east London is one of the East End's last surviving public baths, a longtime haven for cabbies, boxers and dockworkers. But even as one type of bathing culture fades, another is on the rise.

Four kilometres (2.5 miles) north, at Hackney Wick Community Sauna Baths, visitors sweat in saunas converted from horseboxes. When they emerge, pink-faced, into the open air, they plunge themselves into water-filled whiskey barrels. The highs, which come from alternating between temperatures, are not limited to hipsters in Hackney. Gabrielle Reason of the British Sauna Society reckons there are now 53 such "authentic saunas" across Britain, a number which has doubled every year since 2018. Half of them are on the coast, where visitors can plunge into the sea and then return to the heat.

Part of the fun lies in the optional add-ons. "There's so many different types of sweating," says Ross Elliott, who owns a sauna in Cornwall. To improve blood flow, enthusiasts can slap themselves with Finnish *vihta*, fragrant bouquets of birch branches. Mr Elliott recommends pouring salt from bowl to bowl in front of your face, because "saltmarsh workers have healthier lungs than normal workers". Hackney offers workshops in the art of towel-wafting.

These old and new visions of public bathing can prompt some low-level sniping. "We're inspired by Docklands... but facilities-wise they're a bit rough and ready," says Katie Bracher, a "new wave" sauna consultant. "For us it's a philosophy" but some of them are "having a jolly", opines Anil Singh, Docklands' operation manager.

Other types of sauna are available. When the queen died last year, one gay sauna live-streamed her funeral rather than its usual pornographic films in a profoundly moving show of respect. (Wary of seedy stereotypes, the Soul Water Sauna in Edinburgh is among those to ban "textile-free" bathing.) But all agree on the health benefits. A sauna can reduce pain, improve mood and increase blood circulation. Mr Elliott believes that everyone should try it. "It's almost like trying to tell someone how to surf a wave or have an orgasm. You can't really get it until you've done it."

Education

Making the grade

State-school admissions are rising fast at Oxford and Cambridge

The vast majority of Britons are educated in state schools: 94% of the population and 83% of those who take A-levels. Until recently, admissions to the best universities did not come close to reflecting these numbers. In 2013 state-school students made up 57% and 61% of those admitted to Oxford and Cambridge respectively. Admissions at other leading universities were also weighted towards teenagers who are educated privately.

Since then a quiet revolution has got under way. Every year the number of state-educated pupils getting Oxbridge places has risen; the number gaining admission from private schools has fallen. In 2022 the proportion of state-school students offered places at Oxford was 68%; at Cambridge, 72.5%. Because many members of the Russell Group, a collection of 24 prestigious universities, have long admitted higher proportions of state-school pupils than Oxbridge, the rise there has been less marked: from 78% to 80% in the past eight years. But Hollie Chandler, the group's head of policy, says that its members have "ambitious targets" to admit more students from disadvantaged backgrounds.

Two schools illustrate the change particularly starkly. In 2014, 99 students at Eton College, which has produced 20 prime ministers (most of them Oxford- or Cambridge-educated), got offers to go to Oxbridge; by 2021 this had fallen to 48. That year 54 students at Brampton Manor College, a state school in a poor borough of east London, received offers from the two universities, up from one in 2014.

A few things lie behind this change. The government has given cash to universities to reach underrepresented students and, since 2018, required them to publish plans showing how they are doing this. Universities have been bombarded by hard-to-ignore research into admissions disparities. One report in 2018 showed that eight schools accounted for more Oxbridge places than 2,900 other secondary schools combined; six of them were private.

A law allowing schools to become "academies", with greater control over budgets and staff, has led to the development of many that are exceptionally ambitious for their pupils. Teach First, a scheme that sends clever graduates into tough schools for a couple of years, has also helped raise pupils' aspirations. It began in London, one of the reasons why the highest-performing state schools are concentrated in the capital.

All this has fuelled a joint effort by schools and universities to make pupils consider universities they might once not have done. Visits are crucial, says Deborah Warwick, head of Future Academies in Watford, north-west of London. Last summer one of her pupils, Ciaran Halpin, did an introductory architecture course at Cambridge; the school also set him up with a Cambridge-educated mentor. The son of a lorry driver and a cleaner will become the first person in his family to go to university when he starts there in September. He is looking forward, he says, to living in a beautiful city he can get around by bike and foot, "and just to get studying, really".

Emma Smith, an English professor at Hertford College, Oxford, says the notion that state-school kids are intimidated by Oxbridge can be overdone. In 2017 a class from Kensington Academy, a school in west London, spent a week studying at Hertford after a fire at Grenfell Tower, a nearby block of flats, made their school uninhabitable. During their stay they were shown around Magdalen, an especially majestic college. A handful of students subsequently applied to Magdalen (at least one got in), and none to Hertford . "I think they thought they might as well apply to a college with its own deer park," she says.

Professor Smith says once state-school students are applying in large enough numbers, the difficulty for admissions staff is discerning whether potential should trump the academic attainment of the privately educated (who tend to get better grades at school). Of the roughly 35 pupils who apply for eight English places at Hertford every year, she says, there tend to be two or three strikingly obvious candidates. But the remaining 20 who get to interview can seem equally deserving.

For those state-school kids who do get into top universities, extra help is often needed at first. "If you're going to do this you need to provide extra tutoring in the first year," says an English professor at Oxford who made efforts to admit state-school students before it became fashionable. She says they often do worse in exams at the end of the first year, but clean up in final exams.

That would seem to rebut one of the criticisms made of universities' efforts to correct the state-private imbalance: that letting in more state-school students means standards will slip. Helen Mountfield, the principal of Mansfield College, Oxford, points out that as the college's intake has "diversified"—95% of Mansfield's students are now state-educated—its results have improved. "If you bring in people with diverse experiences and ways of thinking, who challenge one another's assumptions, it promotes intellectual creativity and academic success," she says.

All of which adds up to a potentially momentous change to the case for paying to send children to school. In response, academic private schools, especially in London, are increasingly marketing themselves as conduits to American universities. But they don't have a monopoly over that, either. Lawrence Foley, the chief executive of Future Academies, a network of state secondary schools, says increasing numbers of state-school children are applying to universities in America and getting full scholarships. ■

Mortar boarding

Bagehot | In plain sight

The Tories should forget about the small boats and stop the dodgy car washes and sweet shops

ALWAYS JUDGE a man by his shoes. What works as a rule of thumb for fashionistas also works for people rooting out dodgy employers in Britain. The best way to check whether a car wash is legitimate is to look at the workers' feet, says Mary Creagh, the chair of Ethical Trading Initiative, which looks at labour abuses. A legal operation will have workers in proper boots, as they scrub vehicles by hand. A dodgy one will see poor souls scrubbing cars in soaking trainers. If a business is skimping on wellies, it is probably breaking other rules—whether paying below the minimum wage or hiring people who do not have the right to work in Britain.

Hand car washes, of which there are at least 5,000 across Britain, are the archetypal example of Britain's black-market economy. Rishi Sunak, the prime minister, fears that the tens of thousands of people who cross the Channel in small boats each year will "just disappear" into this economy unless something is done. The government has launched a crackdown on arrivals, signing a £479m ($575m) deal with France to stop migrants and announcing draconian new laws to detain and deport those who make the crossing. But as the government panics about small boats, it ignores the reason why many make the trip: the Conservatives have made it too easy to run a lawbreaking business in Britain.

This fact is oddly overlooked. When car washes do crop up in conversation, they are often portrayed as an amusing example of Britain's lousy productivity, rather than illegality. Why are four workers doing the job of one machine? Yet lawbreaking is "endemic" at car washes, according to a study last year by Nottingham Trent University. In the study 89% of surveyed car washes did not provide payslips. Mandatory "right to work" checks were completed in only 7% of businesses. Only one in ten had the correct insurance. Allegations of modern slavery, where people are forced to work for little or no pay, dog the sector.

Ministers know all this. But when the government attempted to tighten the rules in 2018, it opted for self-regulation. A code, which largely amounted to car washes promising to follow existing laws, has been taken up by few operators. Those businesses that are profitable largely because they do not adhere to the law were less keen. Consumers, meanwhile, are happy to have their Nissan Qashqai washed for a tenner.

Car washes are far from an isolated example. Local fast-fashion operators knock out clothes at scarcely believable prices. Sweatshops operate with impunity in places such as Leicester, with a largely foreign workforce often forced to work in illegal conditions. In 2018 there was an outcry when it emerged that some workers in the city's garment industry were paid as little as £3.50 an hour. A year later, a parliamentary report revealed a glut of problems, from withheld wages to fire doors being padlocked shut. Conditions have not improved. A recent survey by the University of Nottingham revealed about half of textile workers in the city still did not receive minimum wages, sick leave or holiday pay. A third did not receive payslips. A quarter had wages withheld.

Enforcement of basic labour rights is weak. The taxman investigates about 3,000 of Britain's roughly 5m businesses each year for minimum-wage violations. Between 2007 and 2021 just 16 employers were successfully prosecuted for breaking the national minimum-wage law. ("This is an increase on last year's figure (15)," brags the report revealing this triumph.) "It is not even hiding in plain sight, it is just happening in plain sight," says Ms Creagh.

It is possible to run clear and obvious scams in central London. Oxford Street, a busy shopping thoroughfare, has been taken over by stores selling an odd mix of luggage, vape juice and M&Ms priced at £24.99 for a 500g bag. Such shops have skipped business rates to the tune of £9m, according to Westminster Council. Allegations of money-laundering dog the sector. Investigators from the local authority are met with a series of shell companies and directors who do not exist. Weak laws and slack enforcement by national bodies allow scammers to thrive.

The council does what it can. It often raids shops like the ones on Oxford Street on suspicion of selling dodgy goods, whether unsafe vape juice or knock-off chocolate. (One common ruse involves melting down cheap supermarket chocolate and then flogging it as knock-off Wonka bars for £8 a pop.) Think of it as a sequel to the Al Capone approach. Nailing the Chicagoan gangster for murder proved impossible so the authorities charged him with tax evasion. If tax-dodging is proving difficult to prove, whack today's villains for flogging dodgy chocolate instead.

The secret ingredient is crime

The problem is not intractable. There is plenty that the government could do to crack down on black-market businesses. The Conservatives have long promised to meld the disparate agencies in charge of labour abuses into a single body. But it is yet to happen, despite being mooted over three years ago. Stricter identity checks for company directors are contained in an economic-crime bill currently going through Parliament. Yet the government has not guaranteed that Companies House, which registers firms in Britain, will have the resources to apply its new powers.

A skint state will generally intervene only in the most extreme circumstances, meaning low-level crimes are overlooked, argues Dr Alison Gardner from the University of Nottingham. Someone in outright slavery may be rescued. An employee who does not get sick pay or earns less than the minimum wage is out of luck. The tax authorities do not crack down on minimum-wage abuses for the same reason that the police no longer bother to investigate, say, car crime: they usually have bigger things to worry about.

A government serious about dealing with the root causes of illegal immigration, rather than just looking tough, has plenty of options available to it. Until then, anyone looking for an ethical car wash should check for wellies. ■

Germany's economic model

Crunch time

BERLIN AND COLOGNE

The geopolitical crisis has shone a spotlight on long-standing weaknesses

“We are at a time of great upheaval,” said Olaf Scholz on March 6th, standing in front of Schloss Meseberg, a baroque castle in Brandenburg where his cabinet was holding a two-day pow-wow. This is not only because of Russia's war against Ukraine, explained the German chancellor, but because of the transformation required by the environmental crisis. He promised to turn Germany at high speed into a gleaming, climate-neutral economy. But can he pull it all off?

This “new German speed” has become Mr Scholz's mantra. “We already had massive weaknesses before the crisis,” says Clemens Fuest, head of Ifo, a Munich-based economic-policy think-tank. The invasion of Ukraine exposed Germany's dependence on cheap Russian energy, its inability to defend itself militarily and the pitfalls of close economic ties with autocracies, those with China potentially as risky as the ones with Russia. Last year China was again Germany's top trading partner, for the seventh consecutive year, with combined exports and imports of more than €298bn ($320bn), up by around 21% from 2021. Germany depends on China for the import of rare earths that are indispensable in batteries and semiconductors as well as other critical minerals. BASF, a chemicals giant, is investing €10bn in a new factory in southern China. Volkswagen, Europe's biggest carmaker, relies on China for 40%, by volume, of its sales.

The economy's vulnerabilities go well beyond those that have been brought into sharp focus by the Russian invasion a year ago. Germany has also been too slow in decarbonising and digitising its economy and in confronting its demographic problems and the acute shortage of skilled workers that affects especially the mid-sized companies of the *Mittelstand*.

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33 Charlemagne: Taking on big tech

Does all this mean that Germany's entire business model is broken? Most economists do not think so, though deep structural change is needed. “The economy was more resilient than expected,” says Klaus Günter Deutsch of the Federation of German Industries, a lobby group. Last year there was talk of large-scale deindustrialisation because of the spiralling cost of energy that affected in particular the chemicals industry, one of Germany's biggest, but also makers of paper, ceramics and other energy-intensive goods. The DAX, the index of German blue-chips, dropped by 27% in the first nine months of last year, almost twice the fall in Britain's FTSE 100 or America's S&P 500. Some pundits predicted a deep recession for Germany in 2023.

As spring approaches, the outlook is rosier. Helped by a mild winter, Germany never came close to needing gas rationing, as many people had feared. According to government forecasts, Germany is now likely to dodge a recession this year.

The panic about deindustrialisation has also abated. Energy-intensive production has declined by 13% compared with January 2022 (see chart 1 on next page), but overall industrial output has held up. That

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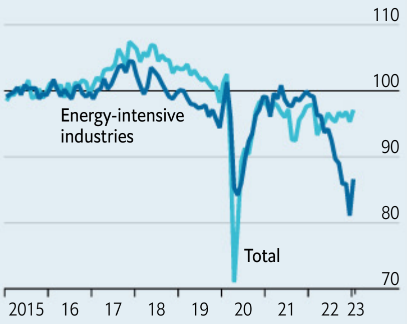


A change of intensity

Germany, industrial production, 2015=100

Source: Destatis

points to a rejigging of supply chains rather than a wholesale process of deindustrialisation. BASF is restructuring its complex production profile to shed low-margin products, for instance. Steelmakers have already done so. "Demand for commodity steel in the German market has decreased significantly in recent decades. We focus on highly specialised steel products that very few can produce," says Markus Grolms of ThyssenKrupp, a big steelmaker.

Rüdiger Bachmann, an economist at Notre Dame University in Indiana, predicts that the geography of German production will shift permanently. A fairly small percentage of German industrial companies that use energy-intensive and relatively simple processes such as the makers of ammonia, zinc or aluminium, will relocate abroad. But others that use more complex production processes are likely to take their place.

Yet even with fewer energy-intensive businesses Germany will need plenty of green energy if it wants to become a climate-neutral economy as planned by 2045. Its efforts to decarbonise are lagging. Its annual carbon footprint, of nine tonnes per person in 2020, is roughly 50% higher than that of France, Italy or Spain (see chart 2). It is a long way to net-zero emissions for a place that likes to think of itself as a climate leader and has spent billions on its *Energiewende,* the strategy to replace fossil fuels with renewables.

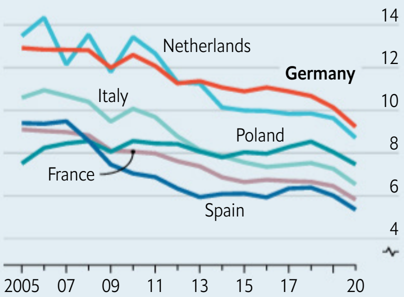
In January Mr Scholz also spoke, in Davos, of the "new German speed" in reaching climate goals. A recent law mandates that the expansion of wind power, solar energy, as well as electricity and hydrogen networks, take priority, he said. Under this new regime, approvals for electricity grids are being granted, on average, two years faster than before. This year the Scholz government has more than doubled the volume of calls for tender for onshore wind farms. The chancellor's ambitious goal is to erect four or five new wind turbines every day until the 2030s. By 2030 fully 80% of German electricity production will come from renewables, promises Mr Scholz. It is a tall order.

The digitisation of businesses is another area where Germany has been too slow and too bureaucratic. It ranks only around average among EU members on businesses' integration of digital technologies. Its public administration is woefully analogue. It mostly dealt with the pandemic by using the fax machine. Many states and municipalities missed a deadline last year, set by a federal law in 2017, to make almost 600 public services available online.

There is progress in some areas, especially in the private sector. According to the government's Gigabit strategy, at least 50% of German households and businesses are to be connected to the optical-fibre network by 2025 and all households should be connected by 2030. *Mittelstand* companies are making progress, in particular those in the engineering and machinery industries. But the cultural shift needed to embrace the digital economy takes time. Firms' readiness to embrace technology often depends on the age of the CEO, says Matthias Knecht, the 41-year-old co-founder of Billie, a startup in Berlin that specialises in business-to-business payments.

The final neglected challenge is the replacement of retiring workers. Germany's working-age population is around 64% of the overall population, similar to America's. But the largest cohorts are in their late 50s and early 60s. Firms are already struggling to fill vacancies (see chart 3). The Institute for Employment Research, a think-tank, predicts that without more immigration or policy changes, the labour market will lose 7m workers by 2035, from 46m now. But there is some potential in giving older workers and those working part-time more incentives to add hours.

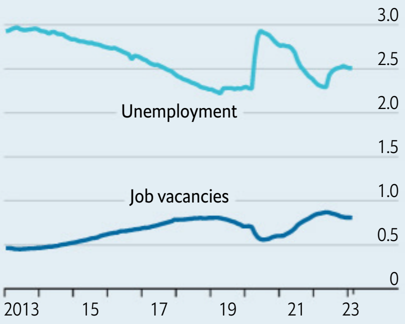
Retraining the workforce is a central element of businesses' strategies to tackle this shortage of skilled workers. "We are planning a training programme of at least 12 full working days per worker, mostly because of new manufacturing techniques," says Rene Wolf, of Ford Europe in Cologne.



Not so green

CO_2 emissions per person, consumption-based*, tonnes

Source: Our World in Data *Emissions adjusted for trade



Tight as a drum

Germany, m

Source: Federal Employment Agency

Higher pay would help to draw workers to the best and most productive firms, but Germany prides itself on wage restraint.

Germany needs an economic-policy *Zeitenwende* (an epochal turning-point) as much as it requires the one Mr Scholz has promised in its military and foreign policy. That is a huge task, given the backlog left by previous governments. Mr Scholz must get his coalition government to stop squabbling. And he needs to achieve something possibly even harder: to get his fellow Germans excited about the future. ■

Austrian populists

Kanzler Kickl?

VIENNA

The alarming comeback of the far-right Freedom Party

A SPECTRE IS haunting Austria—the prospect of a government led by Herbert Kickl, boss of the far-right Freedom Party (FPÖ). According to a poll on March 11th for *Profil*, a weekly, the FPÖ is now comfortably the strongest party in the Alpine republic, with 31% of the vote, followed by the Socialists (SPÖ) at 25% and the centre-right Austrian People's Party (ÖVP) with 22%. If Austrians could vote directly for their chancellor, the poll showed it would be a tie between Mr Kickl and the ÖVP's Karl Nehammer, the incumbent.

The result of recent state elections in Lower Austria, formerly a fief of the ÖVP, confirms the renaissance of the FPÖ. The ÖVP lost its absolute majority, scoring 40% of the vote, its worst result in decades, while the FPÖ's share jumped from 15% to 24%. On March 5th voters in Carinthia, an FPÖ stronghold and Mr Kickl's home state, saw the party take its vote share from 23% in 2018 to 25%; the incumbent state governor's SPÖ lost nine percentage points.

The reason for the FPÖ's comeback is

the poor performance of the leaders of both of the big mainstream parties, the ÖVP and the SPÖ, and the confluence of the pandemic, the war in Ukraine and the cost-of-living crisis. Austrian tourism was especially hard hit by the chaotic covid policies of successive ÖVP-led governments.

Mr Kickl is almost unknown outside Austria, even though, as a hardline ideologue, he was the power behind the throne of both Jörg Haider and Heinz-Christian Strache, two of the FPÖ's long-term leaders. He concocted many of the party's nastiest slogans, such as "More courage for our Viennese blood" and "Home, not Islam".

He rose to the top after a scandal rocked Austria in May 2019 that seemed to spell the final destruction of the FPÖ. A secretly filmed video showed Mr Strache, then the FPÖ's boss, at a villa in the Spanish island of Ibiza where he appeared to promise government contracts in exchange for party donations to a woman who claimed to be the niece of an oligarch close to Vladimir Putin, Russia's president. Mr Strache was out, both as boss of the FPÖ and as Austria's vice-chancellor, within 24 hours.

Sebastian Kurz, who was then the chancellor, dissolved the coalition government of his ÖVP and the FPÖ, and called an early general election. Support for the FPÖ thereupon plunged by a third, from 25% to just 16%. Mr Kurz picked the Greens as his new coalition partners rather than the FPÖ.

At municipal elections in Vienna the following year, the FPÖ's vote slumped even more, from 30% to a dismal 7%. By then led by Norbert Hofer, the party was riven by bitter battles between a more conciliatory faction close to Mr Hofer and acolytes of the openly xenophobic Mr Kickl. In June 2021 Mr Hofer threw in the towel. Mr Kickl became the party's undisputed boss.

"The international fixation on Jörg Haider meant that once he was gone, the alarm about his party faded," says Andreas Peham, an expert on the far right at the Documentation Centre of Austrian Resistance. (Haider died in a car crash in 2008 at the age of 58.) But the party's views have since become still more radical. Mr Kickl, for instance, has sounded ambivalent about his party's attitude to the identitarian movement, Europe's answer to America's alt-right, with its anti-Muslim, anti-media and anti-migrant messages.

As a result of this radical lurch, the other bigger parties say they will refuse to consider any type of alliance with the FPÖ. So even if it were to be the strongest party at next year's general election, it would get back into government only if the other party leaders changed their mind. They used to ostracise Haider and his FPÖ. But in 2000 Wolfgang Schüssel, the chancellor and ÖVP leader, broke that taboo. In fact, the FPÖ has been part of a coalition government four times in the past 40 years. ■

Hungarians in Ukraine

An uneasy minority

KIDOSH

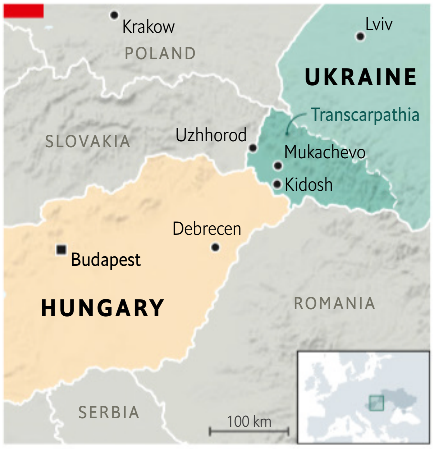
Ethnic Hungarians have been having a hard time of it

"This is not our war," says Dorottya, a kindergarten janitor, using the words of Viktor Orban, Hungary's prime minister. "This is a Hungarian village." But Kidosh is in Ukraine, ten kilometres from the border, in a belt along the frontier inhabited mostly by ethnic Hungarians. Gabor, her 14-year-old son, says he does not feel Ukrainian, does not speak Ukrainian and since "life is not good here", he wants to go to a boarding school in Hungary, whence he will probably never return.

Official Hungarian-Ukrainian relations have been frosty for years and the war has made them worse. As a result, Ukraine's Hungarian minority has suffered. Its numbers have been shrinking and the war is accelerating the exodus. Its members are also divided. Karoly Sass, a winemaker in Kidosh, says that of course "this is our war, we live in this country!"

Almost the entire Hungarian minority in Ukraine lives in the western province of Zakarpattia, commonly known in English as Transcarpathia. In the first post-communist decades, relations between Ukraine and Hungary were excellent, and by 2020 Hungary had provided more than €250m ($264m) in aid to support local Hungarians, and Transcarpathia as a whole. But now relations have deteriorated so much that on January 19th Tamas Menczer, a senior official in Hungary's foreign ministry, accused Ukrainian officials of committing "atrocities" against the minority. He was, it turns out, referring to the removal by police of Hungarian flags from some municipal buildings near the town of Mukachevo.

Such language will have delighted the Kremlin. Since 2014, says Dmytro Tuzhanskyi, director of the Institute for Central European Strategy, a think-tank in Uzhhorod, the provincial capital, Russia has tried hard, but failed, to stoke ethnic tensions in Transcarpathia through social media and other means. Gabor claims that the 1920 Treaty of Trianon, by which Hungary lost two-thirds of its territory, including Transcarpathia, was actually a "contract" which expired after 100 years, so now it should be returned to Hungary. He probably got this nonsense from social media.



Surveys conducted by Mr Tuzhanskyi reveal that there is "almost zero" chance of ethnic conflict in Transcarpathia. But there are real tensions. Since 2017 educational reforms mean that Hungarian-minority state schools must spend increasing amounts of time teaching in Ukrainian. This can be tough for the students.

A new minority-rights law passed last December is also causing problems. Sandor Shpenik, the dean of the Ukrainian-Hungarian Educational Institute at Uzhhorod university, has concluded that the Ukrainian authorities "want us to assimilate or leave". Laszlo Zubanics, the head of the Hungarian Democratic Union of Ukraine says sadly that "the problem is that the new generation is not motivated to learn Ukrainian because they cannot see a future in this country."

And leave they do. According to the last Ukrainian census, back in 2001, there were 151,500 Hungarians in Transcarpathia, which was then 12% of its population. By 2017 a survey found that the number had dropped to 131,000. Now, says Mr Zubanics, the figure for those remaining has fallen to 75,000-85,000. For years it has been easy for Transcarpathian Hungarians to emigrate anywhere in the EU, as Hungary has given them passports.

Last October a bronze sculpture of a symbolic Hungarian eagle that had loomed over Mukachevo atop its castle since 2008 was replaced with a Ukrainian trident. The eagle "was erected as a symbol of friendship", says Andriy Baloha, the (ethnically Ukrainian) mayor: but now the situation has changed. Though he denies it, analysts say the removal of the eagle was part of a row between the "Baloha clan" and local ethnic-Hungarian politicians.

Mr Baloha says that if Kyiv had fallen to Russia last February, Transcarpathia "would have been transferred to Hungary as a gift for supporting Russia". Mr Zubanics scoffs at such talk. A Greater Hungary cannot be recreated, he says. Meanwhile, although plenty of ethnic Hungarians, like so many other people, may have fled Ukraine following the Russian invasion, Mr Shpenik is keen to point out that some 300 of his fellow Transcarpathian Hungarians are at the front, fighting alongside their fellow Ukrainians. ■

Ukraine

Winning the electricity war

KYIV

How Ukraine tamed Russian missile barrages and kept the lights on

Russia was already a month into its campaign to bomb Ukraine's energy infrastructure when the man in charge of Ukraine's power grid, Volodymyr Kudrytsky, saw a fleet of kamikaze drones headed towards his office. The attack on October 17th at Ukrenergo's Kyiv headquarters sent many of his colleagues running for the shelters. Soldiers stayed above ground to try to shoot down the drones. Mr Kudrytsky headed off in his car to help colleagues. "Some of us have experienced five, ten, 20 attacks over this winter and at one point you cease being frightened," he recalls.

The latest raid, in the early hours of March 9th, saw Russia target hundreds of millions of dollars-worth of missiles on critical infrastructure. It tested the tenacity of energy planners for the 15th time this winter. But with most of the country swiftly brought back on line, it did not change the fundamentals; Ukraine is still winning a battle in which few had expected it to prevail. Engineers are now repairing the system faster than it can be destroyed. Before the latest attack, Kyiv had enjoyed four consecutive weeks with no outages. The use by Russia of hard-to-replace Kinzhal air-launched ballistic missiles at the end of winter would appear to indicate increasing desperation in Moscow.

Things were certainly touch and go at times. The initial Russian operation was clinical, targeting hundreds of high-voltage transformers, the house-size workhorses of the national power grid. No electricity meant no gas, no water, no sewage, no heating. Some predicted frozen cities and a humanitarian crisis with millions of refugees. That this did not happen is down to preparation, luck, quick thinking, and new air-defence systems that began to arrive just in time. More than 100 energy workers have lost their lives in the battle.

The darkest days were in late November. When the capital's infrastructure was hit by a barrage of 67 missiles on the 23rd, the system began to switch off automatically to protect itself. For a few hours, Kyiv was completely without electricity, says Serhiy Kovalenko, CEO of Yasno, the company that supplies energy to the capital. It was not clear when the system would come back on again, or whether, indeed, the damaged grid could even support the necessary currents when it did. There was talk that the city would have to drain water from its heating system, for fear that pipes would freeze over and crack. "This was a truly frightening moment," recalls Mr Kovalenko. "We didn't know if it was a matter of hours, days, or even weeks. We were joyful when the grid slowly began to function again later the same day."

As the Russian campaign ground on, Ukraine became ever more adept at countering the airborne threat, and at fixing the damage on the ground. The process now resembles "a chess game with death", says Yuriy Ihnat, a colonel in Ukraine's Air Force Command. "The enemy tries to outwit us, and we try to outwit the enemy." The Russians look to locate and destroy Ukrainian air defences using all the tools at their disposal: A-50 airborne early-warning aircraft, which can detect any Ukrainian missile launch; drones; satellites; and a network of spies. Ukraine responds with its own techniques: deception in the form of fake launch positions, and keeping air-defence assets as mobile as it can.

Winning in the air

At the start of the winter, Ukraine could rely only on Soviet-era systems such as S-300s and Buks. When things were bad, it managed an interception rate of just 20-30%. More recently, with the help of new mobile groups and Western air-defence systems like NASAMS, that figure is, Ukraine claims, regularly above 75%. Ukraine's new Patriot air-defence systems are yet to come on line, so Ukraine cannot intercept high-speed missiles like the Kh-22 anti-ship missile and Kinzhal air-launched hypersonic ballistic missile. The use of such expensive and scarce missiles in the attack on March 9th explains the low interception rate of below 50%.

Ukraine has been helped by ingenious engineering. Ukrenergo's Mr Kudrytsky says his company had deliberately kept back-up stock of high-voltage equipment when refurbishing substations in the years before the war. Besides that, there were what he describes as mind-blowing engineering solutions. After drones hit one facility in November, a particularly hard-to-replace piece of hardware went up in flames. There was no obvious substitute in the storeroom. So the technical team decided to attempt what should have been an impossible repair. "In the electric world, if something is on fire at a voltage class of 330,000v or higher, you say goodbye to it," he says. "But somehow they managed it."

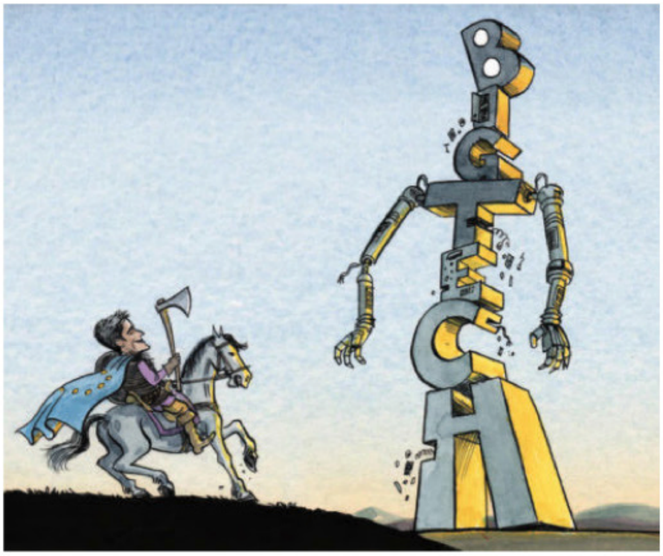
Russia's winter attacks on infrastructure rendered up to half of Ukraine's grid unusable at one stage. But the only indisputably lasting result is that the aggressor has expended much of its reserve of kit: nearly 1,000 missiles and a similar number of drones. Western officials believe Russia is now largely limited to using whatever comes off the production line.

Ukraine for its part is determined to remove as many remaining weaknesses as it can for the months and years ahead. The government has already announced novel plans to protect some of the most vulnerable parts of the grid underground, and to increase air defences above it. Mr Kudrytsky is coy about the details, but, he says, "We showed things that seemed impossible can somehow become possible...We made the impossible ordinary." ■

Electrifying courage

Charlemagne | Trusting the trustbusters

Europe has led the charge against big tech. But does Margrethe Vestager need a new approach?



In the past couple of decades, Europe and America have taken different paths in how they regulate large firms. American watchdogs largely sat back as big business got bigger, most notably the tech mastodons like Google, Apple and Facebook. Europe, in contrast, felt mega-corporations needed to be kept in check. Its regulators became the world's most fearsome, none more so than Margrethe Vestager, the EU's antitrust chief since 2014. Even as Europe failed to come up with tech giants of its own, it was not in California or Washington that Silicon Valley faced most scrutiny, but in rainy Brussels, home to the European Commission.

Liberals anxious to keep markets open and vibrant—including this newspaper—cheered Ms Vestager and the tough approach she embodied. Energetic enforcement of competition rules meant low prices for European consumers shopping for flights, phone calls and more. Americans meanwhile got bilked by firms that had been allowed to consolidate until little competition remained. Perhaps surprisingly, Europe took on even the mighty tech giants, imposing multi-billion-euro fines on the likes of Google and, at times, forcing changes to tech business models. A sweeping new set of rules, known as the Digital Markets Act (DMA), comes into force this year, giving the EU more powers over large tech firms. When the Biden administration from 2021 looked to reverse decades of lax antitrust enforcement in America, its watchdogs borrowed many of their ideas from Ms Vestager.

Europe might be flattered by such imitation. Nonetheless it should now ask itself if its strong-arm approach is still the right one. For even as its regulatory reasoning has remained the same, the corporate environment it is applying it to has changed. At least when it comes to big tech—antitrust's thorniest problem—things have not panned out as Europe thought they would. That should prompt fresh thinking on how to regulate online champions.

Ms Vestager's regulatory method is premised on the idea that consumer tech markets tend to winner-takes-all outcomes: firms that gain an early advantage go on to secure an unassailable perch. Once you have told Facebook who all your friends are, moving to a rival network is all but impossible, even if the site offers a terrible experience. Google fine-tuned its services using troves of data, including years of its users' search and browsing histories. That entrenches its market power. Only by forcing tech incumbents to open up—for example by forcing Google to hand over data to potential rivals to help them train their offerings—could the playing field be somewhat levelled.

That was the theory. But recent developments suggest that tech is far more up-for-grabs than Ms Vestager supposed. Facebook is now struggling to keep current users engaged, let alone to attract young ones. Teens have decamped to TikTok, a zippy short-video app from China. For the first time in two decades of dominance, Google is facing a challenge to the search engine that underpins its profits. Advances in artificial intelligence (AI) are powering a new generation of rivals. Microsoft's Bing, long a distant also-ran, is the latest sensation. Supposed future monopolists like Uber and Netflix have flagged. Across Silicon Valley, tech firms are now laying off workers. The share prices of the biggest firms have sagged, because investors who used to imagine boundless monopoly profits tomorrow now assume competition will grind down margins.

Is big tech's weakening grip on consumers a sign that Europe's approach is working? On the contrary. It was not regulatory action that spurred rivals: both Bing and TikTok have relied on ingenuity more than a helping hand from the state. The lure of capturing vast profit pools spurred innovation, to the benefit of consumers. This is what America's hands-off school of antitrust said would happen—and Europe's assumed could not.

Charlemagne put this case to Ms Vestager in her Brussels office recently. Admirably for a regulator, she is open to those wondering if the assumptions behind the approach that has made her a star among trustbusters may be obsolete. The Dane has noticed tech's recent travails. But she still sees life in her old stringent approach. "It may be over time that digital monopolies are toppled," she says, "but time is not something you have if you want the full potential of innovation to be unlocked." There is plenty of market power to be abused in the years it takes for a better search engine or social-media platform to come along. The power of AI to disrupt monopolies may prove illusory, she says. Mass sackings and sagging share prices are a sign of deflated hype following a pandemic-driven boom, not thriving competition.

Facebook plant

Ms Vestager's record in keeping competition vibrant in old-world industries is creditable. A lot of what she has done to hem in big tech—for example all but banning acquisitions of potential future rivals by large incumbents—still looks sensible. But now she is being goaded to do ever more to rein in the titans. In America a new generation of gung-ho trustbusters is now in charge, with no time for the hands-off model once preferred there. They are stretching competition rules to the limit in a bid to bring large companies to heel, often for ideological reasons. Thanks to the DMA, Europe will gain vast new powers to police large "gatekeeper" firms like Amazon and Apple, so preventing anti-competitive behaviour before it happens. Silicon Valley's foes are hoping Europe will once again become the tech clobberer-in-chief.

This challenge need not be taken up by Ms Vestager. Perhaps fresh evidence will emerge that the antitrust screws do indeed need to be tightened. But a regulator of her calibre should be alive to the possibility that the opposite may be needed. Europe made decisions based on facts at hand; if those facts change, there is no shame in adjusting one's approach. Watchdogs should aim to be as nimble as the businesses they regulate. That can mean being brave enough to bin ideas and adapt to a new reality. ■

The energy transition

Some like it hot

DENVER AND HOUSTON

Climate hawks and Big Oil are both excited about geothermal energy

REBUILDING AMERICA'S ECONOMY

EXIT THE lift on the top floor of the Houston Museum of Natural Science, and the mechanical beeps and whirrs of a model offshore oil rig welcome you to an exhibit entirely devoted to energy. Explore the riveting history of drill bits or how fracking works, all conspicuously sponsored by Exxon, Chevron or another oil major. Amid all the cheerleading for oil and gas, only a small section is dedicated to renewable energy. But in a few years, perhaps a whole wall will be devoted to a different type of drilling—for heat instead of hydrocarbons.

The Inflation Reduction Act, passed by Congress last year, offers lots of federal subsidies for established low-carbon technologies, such as solar and wind, but it also attempts to give nascent ones a boost. Geothermal-energy enthusiasts point out that hot rocks can provide baseload power when there is no sun or wind. The technology is cleaner than gas and requires less land than wind or solar farms. This, then, is a test case for whether public investment can jolt a new industry into being.

America has used geothermal energy since the 1800s, by harnessing heat from hot springs and geysers. Geothermal is plentiful in places where the movement of tectonic plates has pushed magma closer to the Earth's surface, such as along the Ring of Fire, which encircles the Pacific Ocean. Underground reservoirs of steam or hot water are most common, and closest to the surface, in the western states. The vast majority of geothermal-power production happens in Nevada and California. In these plants, which have been operating for decades, hot water is pumped from the reservoirs to create steam, which rotates a turbine. Yet even though America is the world leader in geothermal generation, it accounts for less than 1% of the country's power production.

To use geothermal energy anywhere, not just in places with natural reservoirs near the surface, companies need to drill deep and fracture hot rocks through which they can then pump water or chemicals. It is, in essence, fracking for heat. Unsurprisingly, the hottest rocks, at a depth of 3 to 10km, are also found in the West (see map). No such "enhanced geothermal system" (EGS) commercial power plant yet exists in America. But the potential is immense. The Department of Energy (DOE) hopes that by expanding EGS, geothermal can provide 8.5% of America's electricity generation by 2050. Researchers and startups are also experimenting with using EGS to power carbon-capture systems, and to store excess energy underground, like a giant battery.

There are two main obstacles. One is cost. Exploring and drilling wells miles into the Earth is capital-intensive. And venture-capital firms tend to be squeamish about the technology risk. Cindy Taff, a former Shell executive who runs Sage Geosystems, a geothermal startup, says combination can kill firms. "I guess we're in the valley of death," she adds.

The Inflation Reduction Act should help. Sarah Jewett, director of strategy at Fervo Energy, another startup, says the fact that the investment and production tax

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credits it offers will be in place for a decade provides some certainty. The $1.2trn infrastructure bill, passed in 2021, is also helping fund startups' pilot projects. One of the DOE's "earthshots", or missions to accelerate climate tech, is to reduce the cost of enhanced geothermal power by 90%, to $45 per megawatt-hour, by 2035.

As ever, permitting problems could get in the way. Some 90% of natural geothermal resources are on lands owned by the federal government. An analysis by the National Renewable Energy Laboratory, near Denver, suggests that a geothermal project could trigger up to six separate environmental assessments. Under such a regime, it could take seven to ten years to go from exploration to construction of a geothermal power plant. The Burning Man Project, the non-profit behind a pyromaniacal festival in Nevada, is suing the Bureau of Land Management (BLM) over its approval of geothermal exploration in a town close to the annual bacchanal. Lauren Boyd, acting director of the Geothermal Technologies Office, within the DOE, says the oil-and-gas industry enjoys a more straightforward permitting process than geothermal.

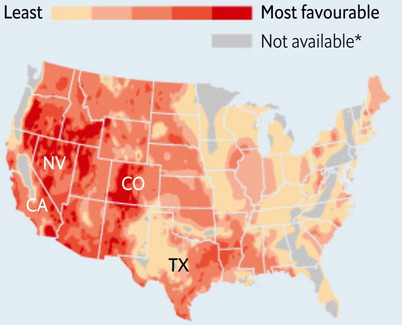
But where developers see despair, Texas spies opportunity. The state has fewer natural geothermal resources, but only 2% of its lands are owned by the feds. "If you drill here, you gotta go deeper," says Matt Welch, of the Texas Geothermal Energy Alliance. But, he argues, that may be easier than "if you're in Nevada, and you're in your tenth year…and now you have Burning Man coming after you." Because Texas is bursting with oil-and-gas companies, and fracking is central to EGS, Houston has become a capital for geothermal startups.

The technology and skills needed to drill for heat, such as horizontal drilling, have been honed during the shale boom. Some startups are even experimenting with converting existing or abandoned oil and gas wells into geothermal ones. The Congressional Research Service suggests that the skills of three-quarters of the oil-and-gas workforce are relevant to geothermal. But President Joe Biden's focus on creating new clean-energy jobs does not quite match the reality on the ground. Jared Polis, Colorado's Democratic governor, who is bullish on geothermal, says he is more concerned with his state's labour shortage than a potential jobs shortfall.

Many startup executives say they fled oil and gas for geothermal because they were queasy about hawking planet-warming fossil fuels. Ms Jewett refers to her years in the Wyoming oilfields as her time on "the dark side". But geothermal's similarities to oil and gas could also become a problem. The oil majors may wonder whether geothermal has the potential to cannibalise their business. Environmentalists may fret that scaling up geothermal also secures a future for fracking, which can increase the risk of earthquakes.

Hot stuff

United States, favourability of enhanced geothermal systems (EGS), 2018



*Regions not assessed for deep EGS potential as temperatures are below 150°C at 10km below surface level
Source: National Renewable Energy Laboratory

Meanwhile, investors are eagerly awaiting results from startups' pilot projects. It could become clear as soon as this year whether enhanced geothermal is ready for prime time, or whether the DOE's earthshot is really a moonshot. ■

Fraud

SNAP, crackle, pop

WASHINGTON, DC

Theft from government anti-poverty programmes seems troublingly easy

DEE AND her husband thought they had left the tough times behind them. Having spent the previous six months living in a homeless shelter in Baltimore with their small child, they were finally living in an apartment on their own. With some government-supported cash and food assistance, they would be able to make ends meet. That was until their cash was stolen by fraudsters earlier this month. Now Dee wonders if they made a mistake leaving the shelter so soon.

The covid-19 pandemic forced governments all over the world to temporarily increase social-welfare programmes. In America the Supplemental Nutrition Assistance Programme (SNAP), federal aid that provides food for the needy more commonly known as food stamps, increased by at least $95 per eligible family per month. Some states also used the Temporary Assistance for Needy Families (TANF) programme, a federal cash-assistance scheme, to further help vulnerable families. Other states provided additional help: California gave tax refunds this year to some residents to offset high inflation.

Some of that money was stolen too. "Anytime there's that much money being punched out with antiquated processes and systems, you are going to have fraud," says Haywood Talcove of LexisNexis Risk Solutions, a firm that sells fraud-prevention services. Criminals can obtain personal details through phishing (sending emails or other messages to encourage people to reveal their account numbers, private identification numbers and other important data) or skimming (illegally placing gadgets over card readers and other devices to steal account information). This information is also sold on the dark web.

Mr Talcove estimates that about $20bn could be stolen over the next six months from SNAP, an assumed fraud rate of 15%. The United States Department of Agriculture (USDA), the agency that administers the programme, reckons that the sum will be much lower: it forecasts a fraud rate of only 0.01-0.02%. States have their own estimates. Maryland recently announced that $2.5m was stolen from its food assistance programme between October and February; California says it reimbursed $7.4m in food aid and $39.7m in cash assistance due to electronic theft between July 2021 and November 2022.

Vastly more money may have vanished through unforced errors rather than outright crime. The Government Accountability Office estimates that $281bn was lost by the federal government during the 2021 fiscal year due to overpayment to eligible individuals or paying the wrong person.

How can this waste be prevented? Typically the government does not have much of an incentive to prevent fraud, says Linda Miller, the former Deputy Executive Director for the Pandemic Response Accountability Committee, a government agency that was created to oversee pandemic spending. These agencies are usually more focused on getting relief to those who need it, she says. And what would seem like obvious penalties, such as reducing the budget at the USDA for failing to curb fraud, would come at a cost to needy families who rely on those funds to eat.

Having been fleeced, some states are trying to adopt the sort of anti-fraud measures that are common in the banking system. California is planning to upgrade security for debit cards used to transfer benefits. State senator Katie Fry Hester of Maryland introduced a bill in her state which requires Maryland's Department of Human Services to reimburse victims of fraud. It would also encourage the state to hire vendors that meet certain criteria, such as holding a form of insurance that can be used to reimburse a beneficiary for fraud and identity theft. But as to the wasteful government spending that all this fraud represents, it seems that is just viewed as a cost of doing business. ■

Chicago's school crisis

Class half empty

CHICAGO

Chicago's public schools are emptying. Politics makes it hard to fix

FROM THE OUTSIDE, Hirsch Metropolitan High School, in Greater Grand Crossing, a neighbourhood on the South Side of Chicago, looks as grand as ever. Its handsome building, constructed in the mid-1920s in red brick with turrets in cream terracotta, occupies most of a city block. The problem is on the inside. The school, which was built for 1,100 pupils, has just 113 on its books. That is far too few to provide a broad education. "They don't even have enough funding, barely, to have full classes," says Maria Owens, a lawyer who volunteers on the school's council. Though the school has been able to start a theatre programme, other extra-curricular activities are lacking. The swimming pool and music room are out of use.

Hirsch is one of dozens of schools across Chicago, mostly on the west and south sides, that are struggling with enrolment that has collapsed. Though schools across America are losing pupils, in Chicago, the problem is particularly acute, partly due to the city's policies, and partly due to its deeply ingrained racial segregation. Chicago's mayoral election—the run-off of which is on April 4th—has focused so far almost exclusively on the problem of crime. Yet both candidates have backgrounds in education. Paul Vallas is a former chief executive of Chicago Public Schools; Brandon Johnson is a former public school teacher who is backed by the teachers' union. And education has a history of tripping up Chicago's politicians.

Taxi for one

The basic problem is an "overproduction of schools", says Stephanie Farmer, an academic at Roosevelt University. In 2006, Hirsch still educated almost 900 pupils. But since then, dozens of new charter schools have opened, even as the number of school-age children has fallen, particularly in majority-black neighbourhoods like Greater Grand Crossing. The result is that there are too few pupils to go around. And since 2017, money has been distributed to schools on a per-pupil basis. That means that schools that shrink invariably have to make cutbacks. Teachers are laid off; discretionary classes and activities are cancelled; sometimes classes of different year groups are even combined. In 2019, Ms Farmer calculated that most of the underfunded schools in the city are in majority-black neighbourhoods.

Yet money is only part of the problem. Though, on paper, funding follows individual students, "equity" grants from the school district mean that smaller schools do in fact still get more. These have surged since the pandemic, thanks to higher property-tax revenues and federal pandemic relief cash. For example, according to state figures, in 2022, Hirsch spent $42,000 directly per pupil, against a figure of $17,000 across the Chicago school district in general. Extra spending "is basically what's holding the schools together right now", says Andrea Zayas, who teaches at a charter elementary school.

But it is not enough to stop schools from losing pupils. A school with just 100 pupils needs almost as many janitors, security guards and librarians as one with 1,000, which means even very large per-pupil budgets do not always go far. Nor can cash solve the problem that there are not enough children for a sports team. According to data collated by ChalkBeat, a website, from 2018 to 2022 high schools with fewer than 250 pupils lost a third of their enrolment. Larger schools grew slightly.

The obvious solution is to consolidate schools—reallocating some buildings and closing others. Yet that is politically difficult. Starting in 2013, Rahm Emanuel, Chicago's former mayor, closed 50 struggling schools, largely to save money. But there were unintended consequences. Pupils who moved sometimes found they were persecuted by gangs at the schools they arrived at. Research by the University of Chicago found that those moved also saw their test scores plummet, at least initially. All that convinced many black voters that the closures were simply a way to remove money from their already struggling neighbourhoods, says Daniel Anello of Kids First Chicago, an education NGO.

So far, neither candidate for mayor has outlined what they would do. Mr Johnson's education plan argues that more social services should be located in underused school buildings, to help share the burden of maintaining and staffing them. That could be helpful, but is unlikely to be enough. Mr Vallas has said that he is committed to school choice, but he has not explained what should happen to the schools parents decline to choose. They may both be hoping to dodge the problem: in 2025, control of schools will be handed to a 21-member school board, which by 2027 will be fully elected, with no mayoral input.

Yet the problem is more urgent than that. A new teachers' contract is due to be negotiated next year, and teachers are likely to push for pay increases (though over a third already make more than $100,000). A black hole in Chicago's municipal pensions plan (which covers non-teaching staff at schools) may have to be filled from the schools budget. And kids are already struggling to catch up from pandemic school closures. Just a fifth of Chicago's high school students are able to read and do maths at their appropriate grade level, a far lower rate than in 2019. Whoever wins the election may find that, after months of talking about crime, education is in fact what defines their first term. ■

Food prices

Eggstortionate

WASHINGTON, DC

You can't make an omelette without breaking antitrust laws

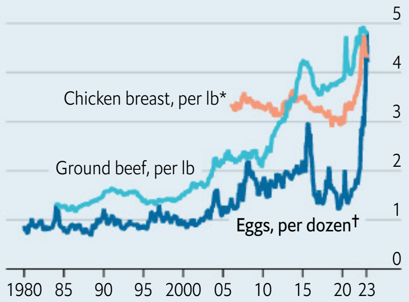
WHEN THE holiday-induced baking frenzy passed and demand for snickerdoodles slowed, many thought egg prices would fall. The cost of a dozen had surged by more than that of any other supermarket item, from $1.79 to $4.25 in the year to December 2022. Could they get any pricier? Indeed they could. When January came to a close, Joe Biden told America that food inflation was cooling. But egg prices had risen by another 13.5%.

The Department of Agriculture blamed last year's price spike on an avian-flu outbreak that killed 43m of America's egg-laying birds. Industry lobbyists say that the rising costs of feed, fuel and labour further pushed up prices.

Such problems tend to beget shortages, but Cal-Maine Foods, which has 20% of the market and is the country's biggest egg producer, sold more eggs in 2022 than in 2021 (the company sells about 12bn eggs a year). Though flocks in the industry overall were a tad smaller, the Stakhanovite hens laid more. Ultimately inflation and flu brought a boon to Big Egg. While the S&P 500 fell by 9% last year, Cal-Maine's shares

Eggsponential

United States, average price, $



Source: Bureau of Labour Statistics

*Boneless †Large white, grade A

rose by 17%. The firm generated $800m in sales in the final quarter of 2022, a 110% increase on the same period the previous year; gross profits increased seven-fold.

Farm Action, an advocacy group which supports small farmers (and hates genetically modified crops), has accused Cal-Maine and two other big egg companies of price gouging, arguing that the virus, supply-chain disruptions and inflation together do not justify the price rises. The firms, Farm Aid argued in a letter to the Federal Trade Commission, cite these trends to hide unjustified price hikes. Together the three account for close to 40% of eggs sold in America, an impressive (or worrying) amount of market power.

Cal-Maine rejects the accusations levelled at it by Farm Action. "Regardless of market conditions, Cal-Maine sells its eggs based on the pricing negotiated with each customer and has done so consistently throughout our history, whether at a profit or a loss," the firm says.

If the soaring profits were just a reflection of normal market power, other food companies ought to have seen them too. But there was no such bonanza in the meatpacking industry, which, run by a handful of powerful firms, is often accused by farmers of acting like an oligopoly. Pre-tax profits on beef, pork and prepared foods at Tyson Foods, one of the biggest meatpackers in America, were down in the fourth quarter. Fast-food firms did not do too well, either. Net income at PepsiCo, which sells snacks as well as sugary drinks, was less than half what it was during the same period the previous year.

To the relief of the nation's bakers, scramblers and lovers of pisco sours, the price of eggs came down in February. The cost of a dozen fell by 12.7%, to $4.21. But that is still more than double last year's price. If the price of eggs does not continue to fall in the coming months, then Big Egg may find federal agencies in charge of things other than interest rates and agriculture crack down on price rises. And when the feds get involved, it is no yolk. ■

Cetacean life

Ahab in Brooklyn

NEW YORK

Why are so many whales washing up dead on east-coast beaches?

LUNA WAS last seen alive in September off the coast of Nova Scotia. Scientists had been tracking the 40-year-old whale for decades. Like all humpback whales his tail, called a fluke, had distinctive pigmentation patterns. These are used by scientists as a sort of fingerprint. Luna's fluke had a moon shape, hence his name. Those tracking him knew every scar and took note of new ones whenever they saw him. The next time he was seen was when his carcass washed ashore in January on Lido Beach on Long Island, about 40 miles (65km) from Manhattan and 600 miles from Nova Scotia.

Whales have been dying in elevated numbers along America's east coast since 2016. So much so that the National Oceanic and Atmospheric Administration, the federal agency that monitors fisheries and oceans, declared the existence of an "Unusual Mortality Event" back in 2017. Prior to 2007, Rob DiGiovanni, the chief scientist at the Atlantic Marine Conservation Society, which surveys wildlife and conducts necropsies, said he saw stranded whales just once every two years. Then it became one to three a year; now it is every few weeks. Since the start of December, 29 dead whales, including right whales, whose numbers are already precarious, have washed ashore along America's east coast. Luna was the tenth of 13 whales to be found dead on New York and New Jersey beaches. Scientists are trying to figure out why.

A whale necropsy is a huge undertaking. The equipment may entail cranes to lift the whale, as well as sharp knives to fillet it. In 40% of the necropsies, there was evidence of blunt force trauma or propeller wounds, which indicates the whales were hit by a vessel, or evidence of entanglement in fishing gear. Some die of natural causes; others from ingesting debris. Paul Sieswerda of Gotham Whale, a research organisation, said that vessel strikes are the equivalent of "the butler standing there with a smoking gun." Preliminary findings from Luna's necropsy indicate a vessel was the probable cause of death.

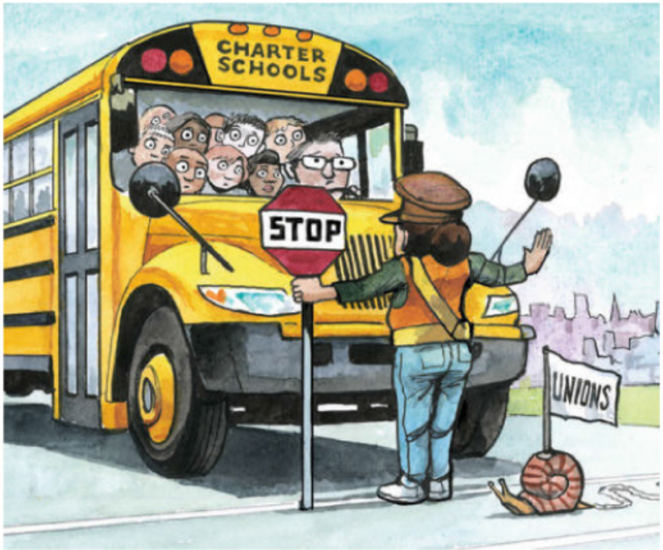
Whale sightings, particularly of humpbacks, have increased in the New York Bight, which stretches from the tip of Long Island to the far end of the Jersey Shore. Like their human neighbours, the whales are drawn to the Big Apple's cuisine. Menhaden, a kind of fish many whales feed on, have increased off the shores of New York and New Jersey, possibly because of warming waters.

No longer must people trek to Maine or Nantucket to see whales. New Yorkers can observe them near city beaches. Several whale-watching companies, including in Brooklyn, have sprung up. Unfortunately, the whales are essentially playing in traffic. New York Harbour is America's busiest port, which puts the whales in the path of all sorts of vessels, including enormous container ships and cruise liners. Some of the carcasses on the beach are the result.

Moby dig

Lexington | Reform school

Why did America's leaders lose interest in fixing its schools?



A POLITICAL STRUGGLE is under way in New York that seems like a throwback to another era: Governor Kathy Hochul, a Democrat, is fighting an uphill battle to permit more so-called charter schools, which use public funds but are run independently and compete for students with conventional public schools.

This is the kind of thing, earlier in this century, that Democrats used to fight about a lot, less with Republicans than among themselves. Under Presidents George W. Bush and Barack Obama, debates raged across the country over how to close academic-achievement gaps between poor minority children and rich white ones. That ferment subsided over the past decade as polarisation and the politics of identity and culture changed the priorities of both parties, leaving them ill-equipped to respond to the toll covid-19 took on America's future, as politicians like to call children.

Waving the banner of "school reform", mayors and superintendents in the Bush and Obama years pushed not just for more spending but for more competition, data and accountability. They wanted to link teacher evaluations and pay to student outcomes, measured by new tests. These reformers advocated shutting down bad schools and creating charter schools, generally unconstrained by union contracts, to invent new ways of engaging students.

Nowhere were the changes more radical than in New York's system, America's biggest with nearly 1.1m students. As mayor, Michael Bloomberg graded schools and replaced those rated as failing with hundreds of smaller schools and charters. Some charters also failed, or came under fire for excessive discipline or cherry-picking applicants. But many exploited their greater flexibility to pay teachers more, lengthen the school year and enrich the curriculum. New York City's charter students consistently outperform those in district schools on the state's standardised tests.

Bureaucratic inertia and political resistance were always strong, and the backlash after Mr Bloomberg's tenure was severe. To the ascendant progressives, in New York and nationally, reformers' emphasis on choice and competition stank of capitalism and their emphasis on testing of racism; charters reeked of both.

Mr Bloomberg's successor, Bill de Blasio, veered away from charters and testing and focused on creating a universal pre-kindergarten programme. He shifted attention from improving the worst schools to opening up access to the best: he fought unsuccessfully to eliminate the admissions test for New York's eight top public high schools, where Asian and white students are over-represented relative to their numbers in the system.

Then covid hit. The disruption in education appears to have wiped out 20 years of gains nationally in reading and maths among nine-year-olds. You might expect America to be obsessed with that, but it is not. Joe Biden has not made public education a priority. Republicans are opting for hysteria, fanning fears of indoctrination. Some are so indoctrinated themselves that Senator Tommy Tuberville, a Republican from Alabama, did not have to explain any terms when, at a recent conservative conference, he compressed the party line into a perfect if accidental haiku: "All this woke, uh/Transgender athletes, uh/ CRT, 1619." The Republican panacea is vouchers, which would fragment public education by letting parents use taxpayer dollars for private schools.

Ms Hochul may be lighting a path back to a more constructive debate. Because of the resistance to charter schools, their numbers have been capped in New York City at 275. In her proposal for the state budget Ms Hochul has, in effect, urged raising that cap by 85, while also allowing operators to apply to run about two dozen other "zombie" charters that have closed.

The Democrat-dominated legislature, under pressure from the teachers' union, is opposed. As the two sides negotiate over the budget, old arguments against charters are resurfacing. The state education commissioner, who is not appointed by the governor, wondered at one hearing why, if charters were so great, they tended to appear in mostly black and brown neighbourhoods, rather than white ones. "The argument is like saying if insulin is such a great drug, why isn't everyone taking it?" fumes Miriam Raccah, who leads an outfit called the Black, Latinx, Asian Charter Collaborative, a group of 21 schools. "Rich white kids have options."

Right to choose

As on crime and policing, some progressives seem out of step on education with the communities they care about. Charters are now rooted in New York's neighbourhoods. There are 275 of them, educating 15% of the students—around 140,000—often in poorer neighbourhoods such as Harlem.

Brian Cunningham, a New York state assemblyman representing parts of Brooklyn, says more than 30% of the schools in his district are charters, and parents are happy to have options. "There are so many choices we stand up for as Democrats and say are human rights," he says, predicting the legislature will come around. "Our whole job here is to create options and access for people."

The school reformers came up with no magic solution. But under Mr Bloomberg, the entire system got stronger. Studies showed that poor black and Latino students in charter schools made significantly more progress, but test scores improved district-wide. Dropout rates plummeted and graduation rates rose by 40%, to historic highs. The quality of teachers, as measured by their own test scores, also improved.

Mr Bush and Mr Obama both called education "the civil-rights issue of our time". (So did Donald Trump, before making civil rights the civil-rights issue of our time.) Their evangelising, combined with the dynamism in cities like New York, brought new, ambitious people in as teachers and principals: better human capital began building better human capital. America's future needs such leadership again. Ms Hochul should stand her ground—and President Biden should speak up. ■

Central America

Borrowing from Bukele

MEXICO CITY AND SAN SALVADOR

El Salvador's authoritarian president is becoming a regional role model

IN JANUARY NAYIB BUKELE, El Salvador's president, carried out the latest of the eye-catching acts that have characterised his time in office. He inaugurated the "terrorist-confinement prison" on the plains near the San Vicente volcano in the centre of the country. Mr Bukele says it will hold 40,000 detainees, which will make it the largest prison in the world (and the most crowded in the Americas).

The president has a talent for getting his country of 6.3m people into global headlines. In 2020 he sent soldiers into the National Assembly to bully it into supporting his security budget. In 2021 El Salvador became the first country to make bitcoin legal tender. Mr Bukele's theatrics and his policies have paid political dividends. His approval rating has not dropped below 75% since he took office in 2019. In February it reached 90%, the highest in Latin America.

The biggest reason for this is a sharp drop in violence during Mr Bukele's presidency. In 2015 El Salvador had the highest murder rate in the world, 106 per 100,000 people (see chart on next page). Last year, according to the government's figures, this had dropped to 7.8. That rate puts El Salvador on a par with the United States. In next-door Honduras it is 36. The "unprecedented reduction in crime" has contributed to "robust [economic] activity", the IMF noted recently. Tourism has recovered from the slump brought on by the pandemic: 2.5m tourists visited El Salvador in 2022, nearly the same number as in 2019. Lonely Planet, a guidebook publisher, lists the country as one of its top destinations for this year.

Politicians in nearby countries are studying Mr Bukele's tactics. Zury Ríos, the front-runner in Guatemala's presidential election, scheduled for June, has called his security policy "a model". Costa Rica's security minister has said the country should adopt it. Leaders outside El Salvador are experimenting with Mr Bukele's methods rather than adopting them in full. But there is popular pressure to go further. That could imperil democracy and human rights in Central America and beyond.

Mr Bukele, who comes across as Hollywood's idea of the hijacker of the president's plane rather than the president himself, seems keen to export his style of government. In January El Salvador announced that it would open an office in Haiti to advise its government how to deal with the gangs that control much of the country. Mr Bukele's associates have set up a political party in Guatemala with the same name and logo as his New Ideas party and have made an attempt, so far unsuccessful, to do the same in Costa Rica. If El Salvador's murder rate stays down, his influence will grow. "If this proves sustainable, a lot of people all over Latin America will be looking to Bukele as a model to follow," says Kevin Casas-Zamora, a former vice-president of Costa Rica who now leads IDEA, a think-tank based in Stockholm.

Mr Bukele's growing soft power abroad is based on a ruthless exercise of hard power at home. Two gangs, Barrio 18 and MS-13, have terrorised Salvadoreans for years. Their main business is extortion. When the violence they caused was at its height, GDP was 16% lower than it would otherwise have been by one estimate. In March last year, after a weekend during which the gangs killed 87 people, Mr Bukele introduced a "state of exception" that allows police to arrest anyone without showing cause. Since then, he boasts, police have locked up 62,000 people, 2% of the adult population. This is the "largest dragnet" ▸▸

ever in Central America, a region given to harsh crackdowns on crime, according to the International Crisis Group, a think-tank based in Brussels.

The results have been dramatic. In Las Cañas, a neighbourhood of Ilopango, a town east of San Salvador, rival gangs used to clash near the football pitch that marked the border between their territories. Anyone passing could be hurt, says Álex Meléndez, a 37-year-old resident. He used to leave his job refurbishing houses at 4pm to get home before dusk. Since the round-ups carried out under Mr Bukele's state of exception, Mr Meléndez has been able to stay out. His mother-in-law has opened a sweet shop. Youngsters play football late into the evening on the formerly contested pitch.

Salvadoreans are paying a high price for relative peace. *El Faro*, a digital newspaper, put it this way in a headline: "No gangs but no more democracy". Yessenia, who works with young people in a Catholic church in Delgado, close to the capital, says youths are no longer scared of gangs and have new opportunities. But now they are frightened of the army and police who patrol the community. "They are always harassed by the authorities," she says. Claudia Ortiz, an opposition lawmaker, says "there is a lot of collateral damage" from Mr Bukele's offensive against crime. "And there is no plan for exiting the emergency."

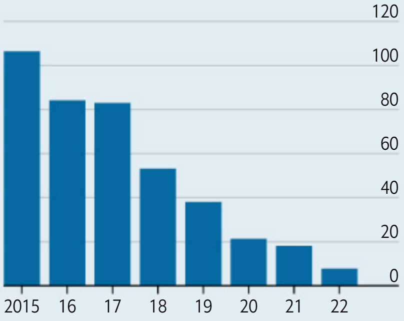
His crackdown on crime is enabled by one on lawful institutions that might get in his way. After intimidating the legislature he won control of it in elections in 2021. Soon after he sacked the attorney-general and judges on the Supreme Court, replacing them with loyalists who renew monthly his state of exception. He has threatened to sue independent media (including *El Faro*). He uses trolls to insult critics on social media and to try to get their accounts shut down. In a ranking of democracies by the Economist Intelligence Unit, our sister company, El Salvador fell further last year than all but three countries (Burkina Faso, Haiti and Russia). It classifies El Salvador's government as a "hybrid regime".

Among the services rendered by the new Supreme Court is permission for Mr Bukele to run for re-election next year, despite a constitutional term limit. He need not commit fraud to win it and to secure again a parliamentary majority. Voters still blame the two main opposition parties, which alternated in power from the end of the civil war in 1992, for misgoverning the country until Mr Bukele came along.

His governing project poses two dangers. The first is that it fails. Many Latin American governments, including past ones in El Salvador, have tried versions of Mr Bukele's *mano dura* (iron fist) policies. All have failed, says Ivan Briscoe of Crisis Group. Guatemala's Plan Escoba in 2004 used extrajudicial killings of gang members. The murder rate rose to record highs.

Steps in the right direction

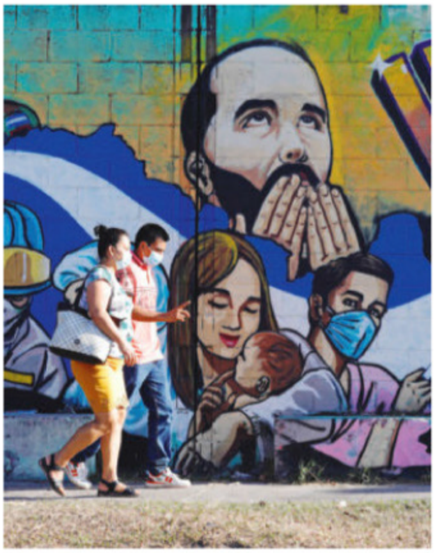
El Salvador, homicides per 100,000 population



Source: National Civil Police

Mr Bukele, like his predecessors, started out by trying to strike deals with gangs. He refused to extradite 14 bosses to the United States and quietly let some out of prison. The crackdown came after relations deteriorated and killings jumped. For now his policy of removing people from the streets, and raising security forces' pay so they don't team up with the criminals, is working, though the violence began dropping before Mr Bukele became president. The government's homicide numbers exclude some victims, such as gangsters who die in shoot-outs with police.

The dip in violence is unlikely to last. People who are wrongly locked up may be forced to join existing gangs in the terrorist-confinement jail to protect themselves. And new criminal networks may form, as has happened in other Latin American prisons. Despite the recovery of tourism and the reduction in violence, El Salvador's economy is not yet growing fast enough to significantly reduce unemployment and poverty, which push young people towards gangs in the first place. "Education, the desire for status and so on has not changed," says Mr Briscoe.



It's Nayib's neighbourhood now

The second danger is that Mr Bukele succeeds, and that he becomes a role model in Central America and beyond. Central America's only full-fledged dictator is Nicaragua's Daniel Ortega, a 77-year-old leftist who overthrew a right-wing regime more than 40 years ago, then lost and regained power. Mr Bukele, a younger, cooler *caudillo*, is likely to have more appeal in a region that is disappointed with democracy.

In the Northern Triangle (El Salvador, Guatemala and Honduras) the democracies that formed in the 1990s after civil wars were mechanisms for sharing spoils between the political parties founded by the combatants. Poverty, violence and corruption have thwarted economic development and fostered crime. Since 2014 more than 2m people have emigrated from the area. Costa Rica, a more prosperous and stable democracy, suffers from political paralysis caused by the fragmentation of power among parties and the president's frequent use of his veto power.

Latin Americans are increasingly willing to sacrifice democracy for security and prosperity. AmericasBarometer, a survey, reports that more than half would give up the right to vote if that would get them decent incomes and basic services. In 2021 half of Salvadoreans, the highest level in Latin America, said that in difficult times the president should be able to shut down the parliament. That is a rise of 33 percentage points from 2018. In neighbouring Guatemala 38% would accept that deal. In Guatemala and Honduras small groups have recently held demonstrations to demand Bukele-style rule.

Leaders in the region are trying some of his tactics, but wary of becoming his clones. In an effort to reduce extortion, in December Honduras's left-leaning president, Xiomara Castro, declared a state of emergency that, like Mr Bukele's, allows the police to jail suspects without charge. But her government has jailed fewer people and exempted some municipalities. Rodrigo Chaves, Costa Rica's president, is under investigation by a parliamentary committee for allegations that he used trolls to harass journalists in the run-up to his election in 2022. Like Mr Bukele he fulminates against the opposition and the press, and rubbishes rather than seeking to reform institutions that he claims hold up progress. Yet Mr Chaves has ruled out adopting Mr Bukele's security model. He pointedly declares that he loves democracy and supports the separation of powers.

The answer to democracy's failings is to "to make democracy work better", says Mr Casas-Zamora. At the moment, to many Salvadoreans and citizens of nearby countries, Mr Bukele's authoritarianism seems more alluring. ■

Israel

A house divided against itself

BEERSHEVA AND JERUSALEM

Binyamin Netanyahu is exposing—and exploiting—Israel's long-standing divisions

BEERSHEVA, A SLEEPY town in the Negev desert, is 100km south but a world away from Tel Aviv. Last year two-thirds of the town voted for parties of the far-right and religious coalition led by Binyamin ("Bibi") Netanyahu, now the prime minister. Yet on March 11th some 10,000 Beershevans felt angry enough to protest against the government's plans to weaken Israel's Supreme Court. "This is a Bibi-ist town," says Zipi Stolero, a retired civil servant who has lived there for 65 years. "But people are marching because they feel...freedom is at risk." That the demonstrations have spread to Beersheva shows how widespread discontent with the government has become.

Protests have buffeted the country for the past ten weeks. Recently around half a million Israelis turned out in demonstrations across the country, clashing with police and bringing parts of Jerusalem and Tel Aviv to a standstill. A third of all of Israel's secular Jews have demonstrated or signed petitions against the government's plans, according to the Israel Democracy Institute, a think-tank (almost no ultra-Orthodox Israelis have followed suit).

They are protesting against a plan of radical "legal reform", which ditches checks and balances in Israel's democracy. Under the reform, the Supreme Court's powers to overturn laws passed by the Knesset, Israel's parliament, will be all but eliminated. New judges will be appointed by a commission stacked with people loyal to the coalition. The government insists this is necessary, arguing that the fiercely independent and activist court has seized powers on the basis of ill-defined laws, in what amounts to a "judicial dictatorship". Israelis taking to the streets are convinced that the legislation is intended to let the government pursue a nationalistic agenda that will pander to the religious parties. They worry that an enfeebled Supreme Court will leave Israel with no effective legal restraints on the government.

Israel in its early decades as an independent country fought what it felt to be existential wars against its Arab neighbours and terrorist organisations. Today it no longer faces such dangers. The risk is from the battle between Israelis. "I've been warning for years that our biggest threat is an internal one," says a former prime minister, Naftali Bennett, who led an unwieldy coalition of right-wingers, centrists, leftists and Islamists for 18 months until last November. "There are those who are trying very hard to divide us into two nations, Israelis and Jews," says Mr Bennett.

Yet Israel has been riven by deep divisions since its founding in 1948. First, between the Jewish majority and a minority of Arab-Palestinians who remained within its borders. Second, within its Jewish population, between the predominantly secular majority, mostly of Ashkenazi (European) heritage, and a more religious minority. Over the decades neither gained an

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advantage. But the divisions have deepened. The current crisis is ostensibly over the democratic character of Israel's institutions. It is also a clash between two Israels: the poorer, more religious one, represented by Mr Netanyahu's coalition; and the largely secular, more middle-class one, which sees the Supreme Court as the guarantor of the country's liberal values.

Israel has held together since its birth thanks to a covenant between these two tribes. The secular majority would serve in the army, build the economy and pay the taxes that help fund the way of life of the ultra-Orthodox, who would largely be exempted from national service and for the most part would study at religious seminaries rather than work. The majority would get to preserve Israel's character as secular and fairly liberal. Now that covenant—Israel's social contract—is breaking.

This is partly explained by the growth in both numbers and power of the Haredi, or ultra-Orthodox community. They currently represent 13% of Israel's population. Since their birth rate is nearly three times higher than secular Israelis', that percentage could double by 2050. Their representation in the Knesset has been rising fast. Their parties have formed alliances with Mr Netanyahu's Likud, a once-secular nationalist party, in the belief that the right has greater respect for Judaism. Both the ultra-Orthodox, who keep away from secular Israelis, and the right-wingers, who are part of mainstream society, chafe at what they claim is the control by a leftist minority of the courts, academia and the media. This has in turn fostered a sense that they have never really been in power, although since 1977 most governments have been formed by Likud in coalition with religious parties. Among the Haredim this belief has sown a growing resentment and distrust of the Supreme Court.

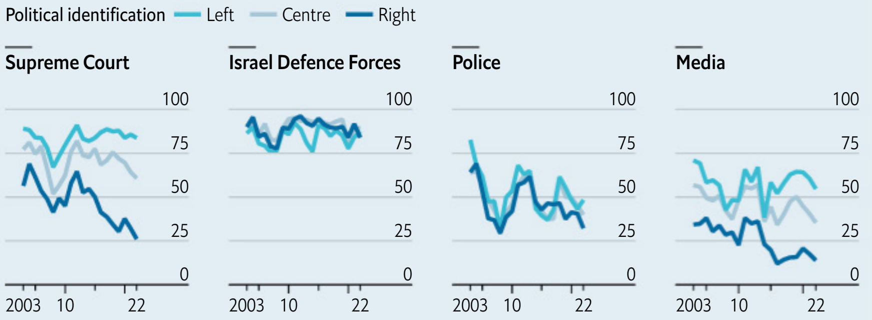
Keep to the paths of righteousness

"Our community has long been on a collision course with the Supreme Court, which doesn't reflect our values and rules on matters pertaining to our lives," says Eli Paley, the chair of the Haredi Institute for Public Affairs. "We're not the ones trying to shape Israeli society according to our values; the court is." Tension has been brewing for decades. In 1999 over quarter of a million Haredim demonstrated against a ruling by the Supreme Court that forced powerful local religious councils to integrate representatives of modern Reform Judaism. The Haredim growl against many of the court's rulings, including one that forbids the public funding of any event where women are separated from men, as is the wont of the ultra-Orthodox.

The last election gave the ultrareligious parties unprecedented sway in government. They demanded that Mr Netanyahu agree to pass a law letting the Knesset override court rulings as a condition for joining his coalition. This new power has stoked secular Israelis' fear that they are being overwhelmed by the ultra-Orthodox and strengthened their determination to fight for the Supreme Court's independence before it is too late.

O ye of varying faith

Jewish Israelis who say they trust selected institutions, %



Source: Israel Democracy Institute

This has surprisingly prompted two parts of Israel's middle class to join the protests: the tech sector and the army. "Communities who have never been involved in politics have mobilised," says Rachel Azaria, a veteran campaigner who leads one of the main protest organisations, adding that tech investors are also financing the demonstrations.

Tech is one of Israel's main success stories and accounts for half the country's exports of goods and services. But its involvement is deepening divisions within the country. Tech firms, which employ one-tenth of the workforce, pay well because they compete for talent globally. But beyond their glittering towers is a less wealthy society. More than a fifth of Israelis live below the national poverty line (2,849 Israeli shekels a month, or $780), as do one-third of Arab Israelis and almost a half of Haredim.

"For thirty years we've fought to keep companies and intellectual property in Israel, despite the pressure to move to the Silicon Valley," says Yigal Erlich, one of the pioneers of Israel's thriving venture-capital industry. "But as strong as the tech sector has become, it needs stability—and the government is now risking that with its crazy legislation." Government supporters accuse tech investors of being privileged bullies and bad losers. If the tech industry has guaranteed Israel's prosperity, the army has maintained its security. Thousands of officers and military pilots have signed petitions, declaring they would not "serve a dictatorship", shocking even those who agree with them.

Both groups present themselves as the country's serving elites, the backbone of its security establishment and a main source of tax revenue. They contrast this with the ultra-Orthodox community supporting Mr Netanyahu, where few young men and women undertake national service.

The protesters, while zealous in demanding that democracy within Israel be protected, are notably silent when it comes to denying basic freedoms to Palestinians on the West Bank, which Israeli forces have occupied since 1967. This points to another division within Israel: between the largely defunct "peace camp", which wants the Palestinians to establish their own state, and the Jewish settler movement, which believes that the entirety of the land between the Jordan river and the Mediterranean Sea should belong to Israel.

Yet another division separates the Jewish majority of Israelis from the Palestinian ones, who make up more than 20% of Israel's population, but have been strikingly absent from the protests. "You won't find one Arab in favour of the government's plans," says Aida Touma-Suleiman, a Knesset member who belongs to Hadash, a communist party. "It's clear that we will be the first to be harmed by any erosion of civil rights. But most of us can't identify with the protests, which are full of nationalistic and militaristic messages. It still keeps Arab citizens on the margins."

The far-right elements of the government are determined to perpetuate the dominance of Israeli settlers over the Palestinians in the West Bank. This has created a dilemma for the pro-democracy movement as to whether it should highlight a connection between the two issues.

Protesters have mostly played down the occupation, preferring a more centrist and "patriotic" campaign message. Left-wingers who turned up to the earlier protests with Palestinian flags in solidarity were discouraged. Instead, the protest movement set up its own flag factory, flooding the streets with them. "Israel's flag is ours again," said Yair Lapid, an opposition leader and former prime minister. But the mood has changed since members of the ruling coalition came out in support of the ▸▸

settlers who rampaged through Huwara, a Palestinian town in the West Bank, after two settlers had been killed nearby. Protesters have started chanting at the police: “Where were you in Huwara?”

How the government and its opponents go about solving the crisis will determine how dangerous those splits become. On March 15th President Isaac Herzog, a former leader of the Labour Party, proposed a compromise. His plan would give the government more say in appointing new judges but not overall control. It limits the court’s powers but maintains judicial oversight over most governmental actions and allows the court to disqualify legislation with a two-thirds majority. Mr Netanyahu’s coalition has already rejected the proposal.

Those desperate to find a compromise feel they are racing against time to avert a catastrophe. They believe that the Supreme Court will have little choice but to strike down the new laws if they are passed in their present form. The government would almost certainly refuse to accept such a ruling, sparking a constitutional crisis. Gali Baharav-Miara, the attorney-general, also has the power to decide that Mr Netanyahu, who is on trial for strenuously denied corruption charges, is unfit to carry out his duties due to this conflict of interests. Should this happen, the civil service and security forces would have to decide whether to continue taking orders from Mr Netanyahu and his cabinet.

The constitutional crisis has already hit parts of the government. Israel’s police commissioner bowed to pressure from the hardline national-security minister, Itamar Ben-Gvir, and removed Tel Aviv’s chief of police, who had been blamed for “going soft” on protesters. The attorney-general ruled that the removal was unauthorised, leading to his reinstatement.

“These are uncharted waters,” says Efraim Halevy, a former chief of the Mossad intelligence agency. “The security chiefs cannot take orders from a prime minister acting in contravention of the legal authorities. But then who will they take orders from?” The chief of staff of the army, Lieutenant-General Herzi Halevi, made it clear where his ultimate loyalties lie. In a speech to reserve unit commanders he said that the army will obey orders “while keeping to the laws of the state and human dignity, and respecting the values of the state of Israel as a Jewish and democratic state.”

The prime minister is trapped, says one of his former aides. “He realises by now the damage being done to Israeli society and the economy. But his fundamentalist coalition won’t let him go back.”

As the coalition rushes through its legislation and the protests gain momentum, chaos beckons. Economists in Israel and abroad are warning of long-term damage to investor confidence. Meanwhile Palestinian violence has been growing, both in the West Bank and on the streets of Jerusalem and Tel Aviv. Yet if the army is called upon to restore security, thousands of reservists may refuse to turn up for duty.

Both Mr Netanyahu and Mr Bennett, the former prime minister, are steeped in the history of the destruction of the second temple in Jerusalem two thousand years ago, arguing that it was caused not by external foes but by fighting among the Judeans. Yet they have drawn different conclusions. Mr Bennett sees parallels with current events, fearing that the coalition is stoking divisions that threaten Israel’s very existence. Mr Netanyahu thinks that only by staying in power—at any cost—can he prevent calamity befalling the country. With stakes this high, compromise for the moment seems elusive. ■

He fought the law; who will win?

Middle East diplomacy

The less bad old days

DUBAI

China brokers, at best, a small detente between two longtime foes

GO BACK, FOR a moment, to the halcyon days of late 2015, the last time Saudi Arabia and Iran had diplomatic relations. They were at odds in Syria, where they backed opposing sides in the civil war against Bashar al-Assad, and in Yemen, much of which had fallen to the Houthis, a Shia rebel group. Iran was furious over reports that Saudi police had sexually assaulted young Iranian pilgrims at Jeddah’s airport. Four years earlier, America had accused Iran of plotting to assassinate the kingdom’s ambassador in Washington.

Then, one day after the calendar flipped to 2016, Saudi Arabia executed Nimr al-Nimr, a dissident Shia cleric. Rioters in Iran ransacked the Saudi diplomatic missions in Tehran, the capital, and the shrine city of Mashhad. The kingdom quickly severed ties with the Islamic Republic.

On March 10th the two old foes abruptly agreed to end their seven-year rupture. The deal became the subject of excited headlines in the Middle East and America. For the former, it seemed to signal an end to a long-running and ruinous proxy war. The latter was less interested in the substance than the venue: it was signed not in a regional capital but in China, a country that had hitherto played no significant role in the Middle East’s messy diplomacy.

Both reactions were a bit too exuberant. The agreement was transactional, not transformational. The two will remain at daggers drawn, as they were before 2016. China’s participation is more interesting, but still overstated: the deal dropped into its lap. Iran and Saudi Arabia have good reason to praise its role. But it is unlikely to become a new regional peacemaker.

Saudi Arabia and Iran have spent years talking about reconciliation. Such talks have gained new urgency in recent months, largely because both countries are exhausted. The Saudis have failed in their major foreign-policy gambits over the past decade, whether trying to overthrow Mr Assad or dethrone the Houthis. Iran’s victory, if it was one, was Pyrrhic: it is successful abroad but seething at home, as young people rage against a crashing economy and a corrupt dictatorship.

Saudi Arabia’s priority is to extract itself from its war in Yemen, launched in March 2015. Eight years and hundreds of thousands of deaths later, the Houthis still control much of the country and the war has only pushed them closer to Iran. The mullahs now supply the Houthis with weapons, money and training.

The Saudis are eager to strike a deal with the Houthis that would leave the group in power in exchange for an end to cross-border missile and drone attacks. For months they have wanted Iran to press the Houthis to accept. So the Saudi-Iranian agreement may presage a separate agreement in Yemen. That will not end the conflict, which was a civil war before the Saudi-led coalition intervened. But it would offer the kingdom a face-saving exit.

The agreement could also have implications for Iran International, a satellite-television channel established in London in 2017 that airs relentless criticism of the Iranian regime. Its bosses deny any direct links to the Saudi government. Nonetheless, the Iranian government has demanded that Saudi Arabia rein in the channel.

Those demands grew when street protests swept Iran in September. Iran's regime also started threatening journalists working for Iran International. Last month the channel said it would move its broadcasting to Washington.

None of this heralds an era of friendship between Saudi Arabia and Iran. Their ideological disputes date back to Iran's Islamic revolution in 1979. The Saudis will still worry about Iran's nuclear and ballistic-missile programmes and its network of proxies in Arab states. Iran, for its part, will continue to see a Saudi hand in its (self-inflicted) domestic unrest.

Still, the treaty may lower the chances of a cold war turning hot. The United Arab Emirates (UAE) has reached a similar conclusion. Last year it restored full relations with Iran, having downgraded them after the attack on Saudi missions in 2016. The UAE was unnerved by drone attacks last year on Abu Dhabi, its capital, and worries that it could face retaliation for a possible Israeli strike on Iran's nuclear facilities.

In America these points seem secondary. The focus was on the country that brokered the deal, not the signatories. "Seeing the Chinese role here will not warm any hearts in Washington," tweeted Michael Singh of the Washington Institute for Near East Peace Policy, a think-tank.

This is an undeniable shift in China's role. In 2021 Wang Yi, then the foreign minister, proposed a "five-point plan" for Middle East peace, full of banal slogans such as "advocating mutual respect" and "upholding equality and justice". These empty words were the extent of Chinese diplomacy in the region. Now China has taken a far more public role.

Still, caveats are in order. Much of the diplomacy took place not in China but in Iraq and Oman, with America's encouragement. China merely helped nudge the deal over the finish line. And it is hard to see how China can repeat the trick. It has gingerly dipped a toe into the swamp of Israeli-Palestinian peace, but no one expects it to wade in much farther.

Both Iran and Saudi Arabia have reason to play up Chinese involvement. In 2021 the Iranians signed a 25-year "strategic partnership" with China. Ebrahim Raisi, the president, wants his countrymen to think economic ties with the Middle Kingdom are a substitute for relations with the West. As for the Saudis, they hosted Xi Jinping at a big summit in December. China is their largest trading partner and the world's biggest buyer of oil exports. After two chilly years with Mr Biden, it does not hurt to remind the Americans that the kingdom has other powerful friends.

Everyone stands to benefit—at least a bit. Saudi Arabia can ease tensions with a ruthless neighbour. Iran's arch-conservative regime can look open to diplomacy. China can claim a diplomatic victory. But the underlying issues remain. This deal is more about perception than reality. ■

Hooked on pretty flies

Why Kenya is an odd global powerhouse

RONGAI

Sporting fishers across the world depend on its fluffy bait

RED-EYED damsels, pole dancers, two-bit hookers, hot-legs foxy gotcha, woolly buggers, drunk and disorderly, Mrs Simpson and orange boobies are not what you might think. They are just a few of the colourful, dexterously tied flies that fishing folk cast from their rods to lure trout and salmon in the rivers of Scotland, South Carolina, Russia's Kola peninsula and beyond. What these wacky names have in common is that they are among several thousand fluffy but lethal creations that have made Kenya a global hub of fly-tying.

Johnny Onslow, a 67-year-old retired head teacher whose fly-tying firm near the Kenyan town of Rongai is called Gone Fishing, reckons that at least 60% of the world's supply of artificial flies tied to little fish-hooks is made in Kenya. No one really knows, because there are thousands of freelance tyers who do not register with Kenya's tax authorities.

This unusual cottage industry was started in the 1930s by a young Briton in what was then the colony of Kenya after he had broken his back in England playing rugby. Sent to recuperate in the clement African climate, he found that tying flies was a good way for an immobilised fishing fan to keep up his spirits. As his health improved, the hobby gradually became a business.

Don't give it a rude name

Nowadays there are scores of workshops dotted across the country, where entrepreneurial Kenyans of all ethnicities, from freelance tyers in sheds to employers of more than a hundred at long tables, meet orders from as far afield as Chile, Estonia and New Zealand. By far the biggest markets, however, are in north America and western Europe.

As the reputation of Kenya's fly-tyers has spread farther afield, rival firms have sprung up in the Philippines, Sri Lanka, Thailand and Vietnam. Kenyans reckon their ingenuity (those names), speedy delivery, reliability and modest wages should keep them ahead. No one yet has discovered a mechanised method to replace the fiddly business of wrapping silk and cotton around delicate creations of feather, tinsel and fur to simulate a buzzing insect so convincingly that it whets the appetite of greedy trout.

Most of the workers are paid piecemeal for the number of flies they tie. The official minimum monthly wage for such jobs in small towns is only around 19,000 Kenya shillings (about $146), and even less in the countryside. Some firms pay more than twice this rate when nimbler tyers exceed their targets, but even that is still cheap by global standards. Mr Onslow makes a point of hiring a number of disabled workers.

This offers a lesson to other African countries fishing for exports. By dominating a niche, Kenya's fly-tyers have hooked their customers, lined up a growing market and left competitors sinking.

Asia

Pacific security

Great AUKUS

LONDON

America, Australia and Britain will build and man each other's nuclear subs

In 1908 the second USS *Missouri*, an American battleship, sailed from San Francisco to Sydney as part of the so-called Great White Fleet's tour of Asia and circumnavigation of the world. Her successor, the third USS *Missouri*, hosted Japan's surrender in 1945. On March 13th the fourth USS *Missouri*, a Virginia-class attack submarine, lived up to this illustrious lineage by etching her own name in the history of American naval power in the Pacific.

On a warm afternoon in San Diego, Joe Biden, Anthony Albanese and Rishi Sunak, leaders of America, Australia and Britain, gathered in front of the *Missouri* and revealed the next chapter of the AUKUS pact signed by their countries 18 months ago. It will intensify American and British involvement in the Pacific and bind the three allies together in unprecedented ways, into the 2040s and beyond.

This saga began in 2016 when Australia agreed to a $33bn-deal to replace its ageing Collins-class attack submarines with a dozen French diesel-electric boats. In 2021, increasingly mindful of the threat from China, it ended that deal and signed AUKUS with great fanfare. Under its terms, America and Britain would help Australia build a fleet of at least eight nuclear-powered (but not nuclear-armed) submarines. These have far greater range, endurance and stealth than electric boats (see map). They are also far more complex. Only six countries have them and America has previously shared the technology only with Britain.

Mr Biden, Mr Albanese and Mr Sunak revealed that Australia and Britain plan to co-produce the new boat by building on a design for Britain's future attack sub, known as an SSN(R). (An SSN is an attack submarine which carries conventional weapons and hunts other subs and ships, as opposed to an SSBN, which carries nuclear-armed ballistic missiles). Britain will build the first boats at Barrow in north-west England. Australia will learn from the prototypes, then build its own in Adelaide. The idea is to create an economy of scale, with Australian investment boosting British shipbuilding and a larger aggregate order lowering the cost to both countries.

American technology will suffuse this new "SSN-AUKUS". America will provide its vertical-launching system, a set of tubes that can hold a greater number of missiles, and more advanced ones, than traditional torpedo tubes. No British attack submarine has had this capability. The defence industries of all three countries will be entangled to an unprecedented degree. Subsystems like communications gear, sonar and fire control should be compatible between the Anglo-Australian boat and the next American one. "We'll almost be one joint nuclear submarine force," says one official involved in the pact. It will be a "beautiful, blended submarine" gushes another.

But, like that of whisky, the production of high-end subs is measured in double-digit years. Australia's current boats are around 30 years old and must be retired by the early 2030s. The first SSN-AUKUS will not be in Australia's hands until the early 2040s. It takes at least 15 years to produce a submarine commanding officer in Ameri-

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ca's navy, says Tom Shugart, who reached that position himself—partly because of the complexity of training officers in how to use and maintain nuclear propulsion systems. China's navy, the largest in the world, already looks dangerous. To bridge the gap, the three leaders announced two further path-breaking steps.

First, as early as 2027, America and Britain will deploy their own subs to the Pacific in a scheme that some officials are calling "enhanced rotational presence", a deliberate nod to NATO's "enhanced forward presence" of armoured battle groups in eastern Europe. America typically has between two and four attack subs in Asia at any time, according to one official. Under the new set-up, it will rotate up to four Virginia-class subs to HMAS Stirling near Perth—a big and relatively conspicuous step that will require ending a policy of near-total secrecy about sub deployment. Britain intends to rotate one of its own Astute class subs, out of a planned fleet of only seven. Australian sailors have already started embedding in American and British subs.

Second, in the early 2030s, assuming Congress approves, Australia will buy three Virginia-class submarines from America at a discounted rate, with the option of two more, as an interim boat to use until SSN-AUKUS turns up. That America agreed to this is surprising. Renting out a nuclear sub is vanishingly rare: only Russia has ever done it, to India. Australia has struggled to crew its current subs, which take fewer than 60 people; the Virginia-class needs 140 or so. More important, America's navy is struggling to acquire enough Virginia-class subs for itself as it races to close the gap with China. Australia is therefore expected to invest billions of dollars and thousands of workers in American shipyards. Even so, many in Congress may be unhappy with the diversion of hulls. And America's lawmakers may need to amend the International Traffic in Arms Regulations regime, which imposes strict limits on high-tech exports even to allies.

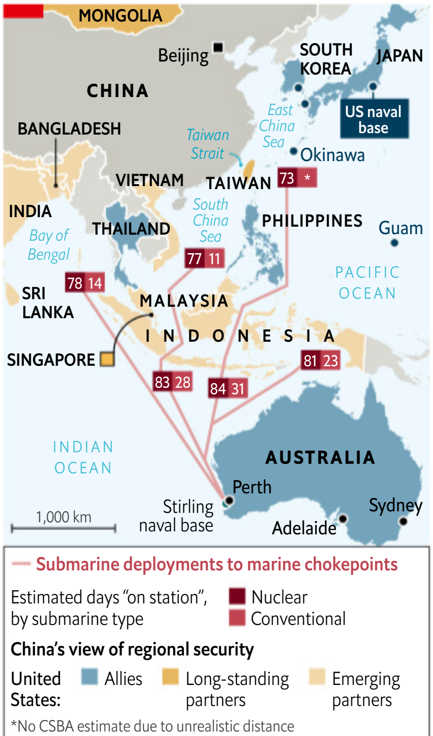
The risks are manifold. The project will need to endure at least three American presidential terms beyond Mr Biden's current one and more than three British elections—a stiff test, even though it has bipartisan support in all three countries. The cost to Australia could be $180bn-245bn over 32 years, according to early estimates. For Australia to produce the necessary skilled labour and nuclear expertise will be hard. "This is potentially a 100-year endeavour," observed Peter Malinauskas, the premier of South Australia, of which Adelaide is the capital, on March 10th.

But the pay-off would be high. For Britain, the benefit is not just a shot in the arm for a submarine industry that has struggled with stop-start construction. It also gives real substance to the government's wished-for "tilt" to the Indo-Pacific. Critics had questioned the wisdom of emphasising naval power in Asia while a land war raged in Europe; Mr Sunak has doubled down. On March 10th he agreed with Emmanuel Macron, France's president, that the two countries would establish "the backbone to a permanent European maritime presence in the Indo-Pacific" by co-ordinating deployments of their aircraft-carriers. On March 13th Mr Sunak's government published a mini-review of foreign policy which emphasised the "epoch-defining" challenge of China. The decision to rotate subs through Asia and co-build new ones with an Asian ally gives the tilt an additional long-term anchor.

I'd like to be, under the sea

For America, AUKUS and the related agreements are the latest and most dramatic step in its steady consolidation of Asian alliances. It is readying to sell hundreds of cruise missiles to Japan and in January agreed to upgrade a marine regiment in Okinawa. In February it secured access to four extra bases in the Philippines. AUKUS also includes a second "pillar" of collaboration on advanced technologies, such as artificial intelligence, quantum systems and hypersonic missiles. And it is part of a wider boom in US-Australian defence ties.

America has invested huge sums in Australia: in building up stockpiles of fuel and ammunition, and in expanding airfields to allow long-range bombers to operate from the north of the country, out of the range of most Chinese missiles. Australian investment in naval bases around Perth to support the rotational deployments of American and British subs will make it easier for the boats to be maintained, repaired and replenished without having to slog back to Guam or Hawaii, enabling a higher tempo of operations in peacetime and war.



*No CSBA estimate due to unrealistic distance
Source: Centre for Strategic and Budgetary Assessment (CSBA)

The fact that AUKUS survived the transition from Australia's centre-right Liberal party to Mr Albanese's centre-left Labor party last year reflects the consensus now baked into Australian politics over the threat from China and the need for drastic measures to confront it. A defence review in 2020 concluded that the prospect of a major war was "less remote than in the past" and the government could no longer be assured of a ten-year warning of such a conflict. (A new defence review written by a former defence minister and military chief was submitted to the government in February, but has not yet been published.)

At present Australia cannot strike a target or protect an expeditionary force more than about 150km from its landmass, points out Ashley Townshend, an Australian expert at the Carnegie Endowment, a think-tank in Washington. The country's new subs, he says, will give it "escalation options" in regional crises where Australian leaders might want to "deter or defeat" a Chinese military presence—say, in South-East Asia or in the southern Pacific. "This will be an Australian sovereign capability," stressed Mr Albanese, "built by Australians, commanded by the Royal Australian Navy and sustained by Australian workers in Australian shipyards."

But the scenario that weighs most heavily on American planners is a larger war over Taiwan. "AUKUS has one overriding objective," declared Mr Biden, in front of the *Missouri*: "to enhance the stability of the Indo-Pacific amid rapidly shifting global dynamics." A US-Australian pact in 2021 spelt out the purpose of all that investment in Australian facilities. It is intended "to support high-end warfighting and combined military operations in the region". Eight additional subs'-worth of missiles prowling in the South and East China Seas would make it significantly harder for China to get an invasion force across the Taiwan Strait or to escalate elsewhere.

That will add to deterrence. Equally significant, it has developed the Anglophone military alliance in Asia to a point of no return. Australia's ports, bases and potentially submarines will increasingly feature in American war plans. That gives Australia influence and leverage over those plans, says Mr Townshend. It also constrains its options. "This is an extremely costly signal of our willingness to contribute to the collective deterrence of China. To back out of it would cause an unimaginable rift in the alliance—which is precisely why it will be taken seriously in Beijing." ■

Indian transport infrastructure

Putting wheels on the elephant

DELHI AND VARANASI

India is getting new roads and railways on a scale only previously seen in China

A SENSE OF WONDER filled the carriage as the Vande Bharat Express raced through the flatlands of Uttar Pradesh, bound from Varanasi to Delhi, at 130kph (81mph). That is a shade faster than the Northeast Regional ferries passengers between New York and Washington—and, by Indian locomotive standards, revolutionary. The train covers its 759km route 130 minutes faster than the next-quickest service. "It's so much more comfortable!" says M. Afzal, 42, a cloth dealer from Varanasi heading to Kanpur, an intermediate stop. "But the main thing is the saving of time."

That sentiment is becoming increasingly commonplace in India. Long known for its interminable, rattling train journeys, snarled roads and grotty airports, the country is experiencing an infrastructural makeover on a scale unprecedented outside China. It will transform Indians' ability to travel, by rail, road and air; and thus to intermingle and do business. The government of Narendra Modi hopes it will remove one of the biggest constraints on the rapid economic growth that India desperately needs in order to meet the aspirations of its young, fast-growing population.

The pace of the buildout is remarkable. The first indigenously designed and built Vande Bharat service was flagged off by Mr Modi in 2019. In the past six months the Hindu-nationalist prime minister, who loves a ribbon-cutting above all things, has inaugurated eight more, including two in Mumbai last month. His government promises to launch 500 more Vande Bharat services in the next three years; it also has ambitions to export the rapid new trains to other countries. A genuinely high-speed line—with top speeds greater than that of America's Acela service—is meanwhile being built, with Japanese help, between the financial capital of Mumbai and Ahmedabad, in the western state of Gujarat. It will cut travel time between the two economic hubs to two hours from six.

Two new "freight corridors", between Mumbai and Delhi and between Punjab and West Bengal, are semi-operational and scheduled to be finished by next year. Another four are on the cards. Their electrified tracks will allow goods to be moved on double-stacked 1km-long trains at speeds of up to 70kph—up from a painful 25kph today. The railways' share of freight traffic has declined in the decade to 2022, even as the overall goods volume has increased. The government hopes its new corridors will boost railway freight from 27% to 45% by 2030. That would mitigate the country's greenhouse-gas emissions as well as its reliance on imported fuel. By decongesting existing lines, the corridors should also allow passenger trains to move faster.

India is at the same time adding 10,000km of highway a year. The length of the rural road network has increased from 381,000km in 2014, when Mr Modi was elected, to 729,000km this year. Over the same period the number of Indian airports has doubled. The prime minister opened an airport in the southern state of Karnataka last month; on March 12th he inaugurated a new highway in the same state.

Mr Modi, backed by state-level leaders of his Bharatiya Janata Party (BJP), has pushed new infrastructure across the board. India's electricity-generation capacity has grown by 22% and renewable-energy capacity has nearly doubled in the five years to 2022. Broadband connections have jumped from 61m before Mr Modi took over to 816m last year. A mobile-based payment system launched in 2016 accounts for over half of digital transactions.

Yet the infrastructure push is mainly focused on transport, which the Modi administration considers the key to India's past failings and its likeliest guarantor of future success. It trusts new roads and railways will help fulfil its ambition to turn India into a $5trn economy by 2025-26—up from $3.5trn today.

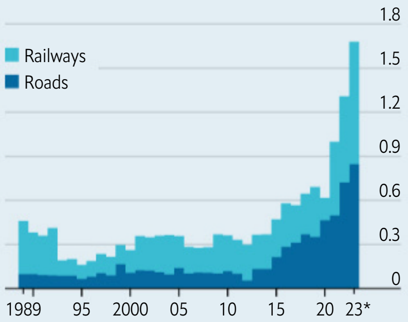
To that end, India will spend 1.7% of GDP on transport infrastructure this year, around twice the level in America and most European countries. If such infrastructure were a central-government department, it would have the third-biggest budget after the finance and defence ministries. The stated aim of the splurge is to cut the cost of logistics within India from around 14% of GDP today to 8% by 2030. It should also, the BJP hopes, help Mr Modi win a third term next year.

The makeover is everywhere stamped with his imprimatur. Mr Modi conducts progress reviews with the rail, roads and other relevant departments every month. His bearded image, underlined with triumphalist BJP slogans, gazes munificently down over construction sites across the country. BJP propagandists present the prime minister as a results-driven leader building India into an *amrit kaal* or, loosely translated, "golden age".

The infrastructure bonanza has clearly accelerated on his watch. The 50,000km of national highway India has added in the ▸▸

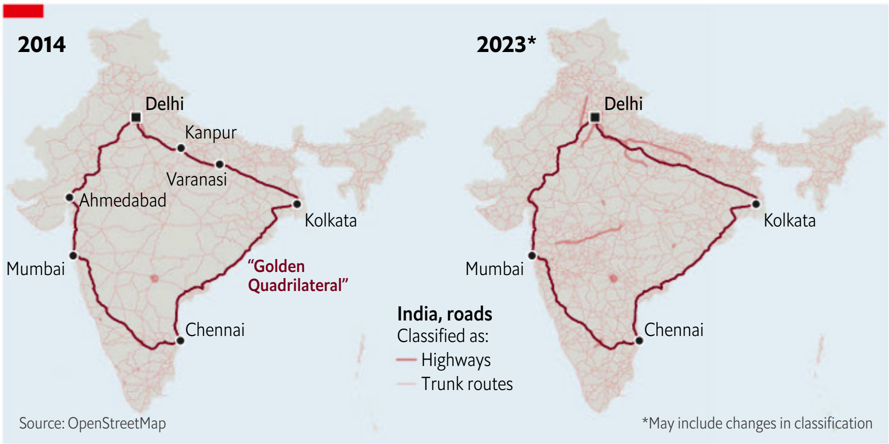
Concrete objectives

India, capital expenditure, % of GDP



Source: CMIE

*Forecast



Source: OpenStreetMap

*May include changes in classification

past eight years is twice as much as it managed in the previous eight. The number of airports with civilian flights has grown from 74 in 2014 to 148 this year. Domestic passenger numbers have duly risen from 60m in 2013 to a peak of 141m in 2019, before the pandemic hit. The aviation minister reckons total passenger numbers could soon be double their pre-pandemic highs, rising to 400m in the next ten years. (Last month Air India, the recently privatised flag-carrier, placed an order worth $70bn for 470 new aircraft from Boeing and Airbus, with an option to buy another 370.)

How has Mr Modi achieved this lift-off? One answer, rarely heard among his admirers, is that he inherited a solid platform from his two immediate predecessors. India's major road-building drive was initiated by Atal Behari Vajpayee, a BJP prime minister from 1998 to 2004. His marquee project, the "Golden Quadrilateral", connected the country's four biggest cities, Chennai, Delhi, Kolkata and Mumbai. He also launched a rural roads programme. His successor, Manmohan Singh of the Congress party, continued those efforts and initiated new projects, including the freight corridors. He also handed more power to the roads ministry, which removed some of the bureaucratic barriers to decision-making.

Mr Modi has doubled down, however, largely by throwing money at the effort. In the financial year starting in April, road and rail will account for nearly 11% of central-government capital spending, up from 2.75% in 2014-15. He deserves credit, too, for putting capable lieutenants in charge of the buildout, such as Nitin Gadkari, the admired roads minister. Instead of endlessly butting heads with the progress-throttling bureaucracy, Mr Modi has also taken selective steps to empower it. In his first review with the roads ministry he more than doubled the amount that civil servants could spend without seeking approval from the treasury. Having run Gujarat for over 12 years, he brought to Delhi a chief minister's penchant for getting stuck into the nitty-gritty of project delivery.

Co-ordinating the revamp is no small task. Roads are being built by a couple of central-government ministries, by India's 28 state governments and by cities. Railways, aviation and ports all fall under different ministries. Land acquisition is tied to cadastral surveys, which are administered by states. Yet improving technology is helping to corral these efforts. In 2021 Mr Modi's government introduced an ambitious data-sharing plan across 16 ministries. The aim is to reduce waste and make the best use of resources, such as by creating and providing high-quality digital maps with dozens of layers of data. That should help make the design of India's emerging transport network as growth-boosting as possible—by connecting ports, airports and industrial clusters to appropriate roads and railways, for example.

Though the new infrastructure is mostly too new for its effects to have been studied, they are likely to be positive. A seminal paper published in 2018 by Dave Donaldson of the Massachusetts Institute of Technology evaluated the economic impact of the 67,247km railway network built on the subcontinent by the British between 1853 and 1930. It found that it "reduced the cost of trading, reduced inter-regional price gaps, and increased trade volumes". Though most of those gains went to the colonial administration, and thence to London, the railways also boosted agricultural incomes in the rural districts they passed through. The railways, Mr Donaldson writes, were responsible for "bringing them out of near-autarky and connecting them with the rest of India and the world". Mr Modi can reasonably expect his infrastructure splurge to have a more advanced version of the same effect.

What Modi does best

Studies of a more recent development, the Golden Quadrilateral, suggest the road network boosted economic activity, reduced transport costs, increased gains from trade and drove up wages, especially for skilled workers. The rural-roads programme has been shown to help move workers from agriculture to more productive jobs. By making that transition appear more feasible, it also inspired improvements in educational attainment in nearby villages. Yet the patchiness of India's infrastructure meant that such positive effects have been too few and unevenly felt. The Golden Quadrilateral connected India's existing economic hubs; the condition of many rural roads remained poor.

Temples in concrete

The contrast with China is striking. In the late 1990s that country set out to connect every city with a population greater than 500,000. Had Vajpayee done something similar, India would have seen more broad-based growth across rich and poor parts of the country (though at much greater cost), according to research by Simon Alder, then at the University of North Carolina. Mr Modi is intent on making good. By enmeshing India in a high-quality transport (and digital and energy) network, his government aims to develop its domestic market, increase connectivity to the outside world, and spread prosperity.

Roadblocks remain. The biggest is land acquisition, which acts as a brake on building anything in India. Its billion-plus citizens have rights and its courts move slowly. Enforcing contracts is tricky in a country where higher courts have 6m pending cases and lower ones face a backlog of 42.6m. Outdated land records and squabbles over title make their task even harder. Obtaining environmental clearances is another headache. Such factors load projects with risks of delay and cost overrun, dissuading private firms from bidding for contracts. The government continues to experiment with the design of contracts but critics say it could do more to attract a wider range of investors.

Indeed, the rapid expansion of infrastructure has not spurred the increase in private investment in the economy at large that many had hoped for. It soared in the decade before Mr Modi came to power, but has since remained subdued in the face of BJP policy missteps such as the demonetisation of large-denomination banknotes in 2016 and the messy rollout of a national goods and services tax.

The covid-19 pandemic did further damage to business confidence. Private investment in 2019-20 was only 22% of GDP, down from 31% in 2010-11. Nirmala Sitharaman, the finance minister, recently beseeched Indian businesses to explain their hesitation to pile in: "I want to hear from India Inc: what's stopping you when countries and industries abroad think this is the place to be now?" Mr Modi echoed her this month, by calling on private companies to "increase their investment just like the government".

What is dissuading them? Beyond the disincentives listed above, the rising cost of capital and uncertainty over demand are making investors wary. Businesspeople whisper other reasons for caution. Mr Modi's government can be capricious. Its use of tax authorities to go after political foes has weakened faith in their impartiality. Regulators' independence can no longer be taken for granted, mutters an investor.

Mr Modi's faith in the transformative power of new transport infrastructure is well judged. It is a precondition for the high growth that India—including above all its millions of poor and emerging middle-class citizens—seriously needs. But without additional reforms, even the prime minister's impressive new ports, roads and railways will not be enough. ■

Banyan Micronesia takes on China

Pacific states are not helpless in the face of great-power pressures

For the annals of great-power competition in the Pacific, the letter from David Panuelo that leaked on March 10th is a keeper. Addressing his country's Congress and state governors, Micronesia's outgoing president describes in engrossing detail Chinese efforts to bully and bribe politicians into toeing a pro-China line. Mr Panuelo accuses China of waging "political warfare" against his country. To mitigate the damage this is doing, he recommends Micronesia switch diplomatic recognition to Taiwan. He claims to have secured a promise of $50m from Taiwan, plus annual payments of $15m, to plug the fiscal hole that shunning China would create.

China's shameless methods for holding sway among small Pacific island states are no secret. Yet the level of detail Mr Panuelo provides is remarkable—and surely deeply embarrassing for China. "We are bribed to be complicit, and bribed to be silent," he writes. He describes Chinese envelopes of cash and offers of trips by private plane to curry favour among politicians and administrators who "advance their personal interest in lieu of the national interest". In another instance, the Chinese ambassador to Micronesia pushed the covid-19 vaccines at the heart of China's recent global propaganda campaigns so incessantly that the president had to change his mobile-phone number.

When gifts do not work, warnings are issued. Mr Panuelo claims to have received "direct threats against my personal safety" from Chinese officials. While attending a Pacific Islands Forum meeting in Fiji, he says he was followed by two men from the Chinese embassy.

China, prickly over perceived slights, even from a nation of just 113,000, called the letter "smears and accusations". But it will struggle to dismiss it. Mr Panuelo has consistently warned of the risks when engaging with China. He published another letter to Pacific island leaders last May, urging them to resist China's pressure to join a "common development vision" that would amount to a new geopolitical bloc. They duly rejected it.

Mr Panuelo's latest insight is how much China's political warfare has to do with Taiwan, which the government in Beijing has an avowed readiness to invade. Micronesia, along with the neighbouring Marshall Islands and Palau, all north of the Equator, would be closer to a conflict over Taiwan than the more numerous Pacific states south of it. It is also close to Guam, a key logistical base for American armed forces in the Western Pacific. To prepare for the possibility of war, Mr Panuelo says, China wants Micronesia to align itself with China against America.

That would imply a dramatic loss of sovereignty. Indeed, a loss of agency is the predicted fate for tiny Pacific states in the face of a great-power struggle between America (and its friends, such as Australia) and China. Yet Mr Panuelo's response suggests that is far from inevitable.

His defiance of China and his public musing about a switch to Taiwan suggest that on some issues Micronesia has a strong hand. China and Taiwan are, after all, in a fierce contest over diplomatic recognition—on March 14th Honduras switched allegiance from Taiwan. As Graeme Smith of the Australian National University in Canberra puts it: "If you're small enough, Taiwan can still be an attractive option. Now it really is as simple as 'Give me so many million dollars, and I'm your friend'". Micronesia needs development goodies, not least to help keep Chuuk, a restive island-state, from breaking away. Even if Micronesia does not switch, China might have to dip deeper into its pocket to keep it on-side.

Meg Keen at the Lowy Institute, a think-tank in Sydney, points out that "geopolitical competition can give small states power". That power is evident in the "compacts of free association" that the Marshall Islands, Micronesia and Palau have renegotiated with America, which has long underwritten their security and provided financial aid. All three countries have obtained increasingly generous terms from the superpower, reflecting its desire to hold them close.

Elsewhere, Fiji's incoming prime minister recently dropped a controversial deal for Chinese security forces to train the country's police, preferring to work with Australia, his country's traditional security partner. All across the Pacific, great-power competition means much more development and many more financial choices; countries can pick carefully among them. The Pacific's tiny nations would rather great-power rivalry did not suffuse their region. But they are not mere hapless victims of it.

Li Qiang

More than a yes-man?

The new head of government has Xi Jinping’s ear. Will Li Qiang challenge his boss?

CHINA’S NEW prime minister, Li Qiang, is a puzzle. He has called private business his native province’s “golden namecard”. He has boasted of the entrepreneurial daring of his home town, and lashed out at officials for interfering with the market. He has scolded scholars for failing to criticise his work boldly enough. But he is also a protégé of Xi Jinping, who has crushed dissent and sent shivers through the business world with his efforts to tighten the Communist Party’s control over everything, not least the economy. Could Mr Li’s appointment, rubber-stamped on March 11th by China’s parliament, make a difference to the way China is run?

Mr Xi’s rule by fear, requiring officials to make endless protestations of loyalty, has made it harder than ever to divine the policy preferences of individual leaders and sense how they get along with each other. In the years leading up to his latest appointment, the 63-year-old Mr Li has hewed to the same script as his colleagues. At the annual parliamentary meeting, known as the National People’s Congress, he heaped praise on Mr Xi, attributing China’s “major achievements” amid a “severe and complex international situation” to his “being at the helm and piloting the ship”. Such phraseology recalls the personality cult that surrounded Mao Zedong.

But it is worth pondering what kind of leader Mr Li might be. His predecessor, Li Keqiang, who is 67, was not close to Mr Xi and was sidelined by him after taking over as prime minister in 2013. Previously, however, the job had offered much clout, especially over economic policy. Two questions now arise. Will Mr Xi give the younger Mr Li, whom he is likely to trust far more than Li Keqiang, any more freedom to set his own agenda? If so, how might he use it?

The two Lis have strikingly different backgrounds. The elder is an intellectual type, whose father was a mid-ranking official. He studied law and economics at the prestigious Peking University. The younger worked in a pumping station and a factory before studying agricultural machinery in his native province, Zhejiang. From early in his career, Li Keqiang appeared on track for a top job in the central leadership. Li Qiang, by contrast, might have remained little known outside Zhejiang had it not been for Mr Xi’s arrival: in 2002 Mr Xi became the province’s party chief. Mr Li was then the party boss of Wenzhou city, a centre of manufacturing in Zhejiang. In 2004 he was promoted, becoming Mr Xi’s chief of staff. (He also continued his part-time studies at Hong Kong Polytechnic University, gaining an MBA in 2005.)

Last October, in a reshuffle of the ruling Politburo, Mr Xi surrounded himself with people who had worked with him during his career in the provinces. Mr Li—by then the party leader of Shanghai—became his number two, replacing Li Keqiang. It was a remarkable promotion. Unlike previous holders of that rank, he had no experience at the central level. Some observers had wondered whether his record in Shanghai, where he had overseen a two-month lockdown of the city in 2022 that was widely resented by residents, might have doomed his chances of rising further. But clearly he had impressed Mr Xi, who then was championing a tough approach to covid-19. ⏩

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Mr Li, however, is no colourless bureaucrat. He may have instincts that are more in tune than Mr Xi's with those of private firms. And he may, just possibly, be prepared to argue with his boss, even though he is likely to be unflinchingly loyal.

In Shanghai many businesspeople liked Mr Li. He helped Tesla, an American electric-vehicle maker, set up a factory that was wholly owned by the company—a rare concession to a foreign firm in China's highly protected automotive industry. He supported the use of imported covid vaccines when the central government was digging in its heels. It still has not approved their use, even though Western-made vaccines are more effective than China's. Whether policy will change now that Mr Li is prime minister will be interesting to watch.

According to Reuters, a news agency, Mr Li was put in charge of the country's covid task-force after last year's Politburo shake-up. He introduced measures to loosen "zero-covid" restrictions. While cases mounted and Mr Xi wavered, the news agency says, Mr Li "resisted pressure from the president to slow the pace of reopening". Reuters was not able to establish how Mr Xi reacted. But in February China's leader declared a "decisive victory" over covid.

Not your typical functionary

In the country's highly secretive political culture, such inside accounts are hard to confirm. But publicly available records of Mr Li's career in the provinces occasionally hint at a man who has views of his own.

One glimpse was offered in 2015 by *Guangming Daily*, a newspaper in Beijing. It said that while working in Zhejiang, Mr Li told a professor at Zhejiang University that the provincial government needed an "independent think-tank like the RAND Corporation" in America to evaluate its performance. Mr Li said it was "very difficult" for official bodies to provide objective analysis and for subordinates to criticise their superiors. The professor accordingly set up a "non-governmental" group of experts in 2009 (though with a party stamp on it: Mr Li was appointed an honorary director).

After taking over as Zhejiang's governor in 2013, Mr Li asked the experts to write reports on his work that "tell the truth". The professor told the group: "We must act like the child in 'The Emperor's New Clothes'." Still, Mr Li reportedly felt the experts' first attempt was not critical enough, so he paid them a visit to solicit face-to-face feedback that was more hard-hitting. On March 13th, at his first press conference after taking over as prime minister, Mr Li said he welcomed suggestions from netizens. On Weibo, a Twitter-like service, censors scrubbed many of their responses.

Unusually for a senior ethnic-Han official, he flaunted his local identity, particularly his ties with Wenzhou. The city is renowned in China for its maverick streak, its citizens having shown a partiality for capitalism even in Mao's day. Its unique dialect, unintelligible to outsiders, fosters a sense in Wenzhou of being different (Mr Li has a hint of the accent). "I was born and bred a Wenzhounese," he said at the inauguration in 2013 of the World Wenzhounese Conference, a group he set up to encourage members of the city's global diaspora to invest in their home town. "The Wenzhounese spirit of daring to be the first and especially of strong entrepreneurship has always inspired and nourished me."

Reducing bureaucratic interference in the market is one of his favourite themes. "Zhejiang is a place where reform and opening up began early and a sense of market rules is relatively strong," he told an interviewer in 2015. "These entrepreneurs should go to the market instead of being cultivated in a greenhouse." To be noted, however, is Mr Li's pioneering role in what became a nationwide government-backed effort to create "characteristic towns", or industrial clusters focused on one type of business, with residential areas around them. Zhejiang's "Dream Town", for tech startups, and "Chocolate Town", for chocolate producers (and tourists), were among his early creations. As the idea spread across China, many such towns became speculative hotspots for housing developers, and the kinds of businesses they were supposed to cultivate sometimes failed to take off. Some became ghost towns.

In his speeches and interviews, Mr Li often spoke glowingly of Zhejiang's most famous private businessman, Jack Ma, the outspoken founder of Alibaba, an e-commerce giant. Read today, such remarks stand out: Mr Ma all but disappeared from public view in 2020. He had dared to criticise financial regulators in a speech. They responded by lashing out at Ant Group, Alibaba's financial affiliate, blocking its listing. That was the start of a regulatory onslaught against China's big tech firms. It wound down last year as the economy faltered and Mr Xi—keen for private-sector support to revive it—began to sound more emollient towards billionaires.

Mr Li's appointment may help a bit to calm their nerves. But businesspeople will remain anxious. On March 10th the legislature approved a restructuring plan for the central government that is likely to result in further power being whittled away from the prime minister and being handed to Mr Xi. It also gave Mr Xi an unprecedented third term as president. Not one of the 2,952 delegates in attendance voted against him. Lest any netizen feel tempted to poke fun at such unanimity, Weibo blocked searches for "#2952". If Mr Li has any different views of how China should be run, he will be super-cautious. He knows the emperor too well. ■

The southern border

New frontier

RUILI

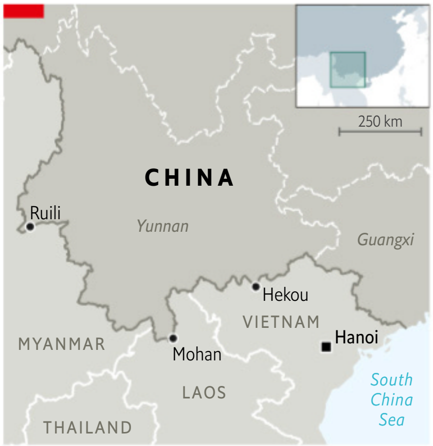
A wall built to keep covid-19 out has changed life along the southern border

In a dusty watermelon field in Ruili, on China's frontier, a farmer leans on his hoe and looks south. He can hear chickens clucking in Myanmar, on the other side of the border. He would once have been able to see the country where he was born and where he still has family and land. Now, though, a steel wall blocks his view. It is topped with barbed wire, cameras and speakers, which occasionally blare out a warning for trespassers to stay away.

Some 5,000km (3,100 miles) long, China's border with South-East Asia stretches from Vietnam to Myanmar (see map). According to a census in 2020, around 8.8m people live in the areas around it on the Chinese side. Crossing points in Ruili, Mohan and Hekou are bustling. Billions of dollars in goods cross the border each year, most legally, some not. Until recently, people on both sides—who are often from the same ethnic group—could mingle and trade without much state interference.

But over the past three years, life has changed along the border. During the covid-19 pandemic, barriers sprang up across China. Most were temporary, designed to keep people inside their homes, lest they spread the virus. The border wall—which is really a collection of fences, walls and barriers—aimed to keep covid out of the country. Parts of it were in place before the pandemic. Now it is "pretty complete", says Hu Zhiding of East China Normal University in Shanghai. Today it is seen by officials as a way to stop smuggling and other illegal activity. What was once China's leakiest border has become one of its tightest.

China's southern borderlands were once famously fractious. Locals who lived ▸▸



amid the hills, forests and rivers that separate China from Myanmar, Laos and Vietnam were masters in "the art of not being governed", as one historian put it. Faced with this challenge, as well as unknown diseases and unforgiving terrain, China's emperors never took full control of the region. They made do with pledges of loyalty from pliable local leaders. Where, exactly, imperial authority ended was unclear. Still, emperors made use of the area. Disgraced officials were exiled to the south, where they often died of malaria.

A few boundary markers were placed in the late 19th century, after negotiations between the weakening Qing dynasty and European colonial officials in what was then Burma and Indochina. Locals probably ignored them. Following the collapse of the Qing dynasty a few decades later, as China fell into chaos, the border became even more of a fiction. In the 1940s American airmen flew across it to battle pilots from Japan, which had invaded China. A few years after that some Kuomintang generals, defeated by the Communist Party in China's civil war, fled across the frontier, eventually starting new careers as opium-trading warlords in northern Burma.

When foreign travel was easy

It was not until 2009 that China and Vietnam agreed on their long-disputed land border, allowing mapmakers to draw a line between China and South-East Asia. The reality on the ground, though, remained messy. At China's official entry points, passports were stamped and customs duties collected. Guards would patrol sensitive areas. But in between them, especially along the border with Myanmar, a multitude of unofficial crossings were used by locals. They might hop across several times a day, to farm their land, work in a factory or simply meet friends.

China grew increasingly concerned. Illegal goods, such as heroin, rosewood and human hair (for wigs), were moving across the border, too. Chinese citizens flowed south, some to gamble in Myanmar's casinos, others to join gangs using telephones or the internet to con people in China out of money. For a while, leaders in Beijing leaned on locals to report suspicious activity along the border. In Ruili, warnings are still painted on walls: "The cowherds are sentries, too. Those ploughing the fields are also on duty."

During the pandemic these efforts took on a new urgency. The priority of local governments was to cut off any source of infections. All foreigners and foreign goods were suspect. Locals were asked to man remote border stations in the forests. Big rewards were offered for catching interlopers. In an interview with state media, one volunteer described the "poisonous snakes" and "knife-wielding drug-smugglers" he encountered as he guarded the frontier. "Wherever the country needs me, I am willing to go!" he said proudly.

At the same time, hundreds of millions of dollars were earmarked to build, expand and fortify barriers along the border. Today the Southern Great Wall, as some call it, cuts through fields and forests. In places it has been dug deep enough to thwart potential tunnellers. Some sections have cameras and motion sensors which, if triggered, will send a live video feed to the mobile phones of nearby guards.

Local leaders claim the wall and other efforts have greatly reduced nefarious activity. At a press conference last June, a police official in Yunnan province said he used the pandemic as an "opportunity" to step up security at the border. As a result, the amount of drugs seized has fallen by 62.4% since late 2021, he boasted. Illegal border crossings for the purpose of fraud, gambling and smuggling have "fallen off a cliff", he added. His claim that over 99% of suspected criminals were caught at the border may have dented his credibility a little. But residents of Ruili, which is in Yunnan, agree that crossing the border illegally has become much harder.

According to state media, the people of Yunnan are happy with this development. "We feel that we are secure and that the motherland is powerful!" said a person quoted in the *Yunnan Daily*, a government-run newspaper. Some inhabitants of Ruili speak approvingly of how the new controls have diminished illegal drug use. Others compare China's construction of its wall with the failed attempt by Donald Trump to complete a wall along America's southern border with Mexico. Nationalist bloggers mock the former president. If Mr Trump had outsourced construction to China, his wall "would have been completed long ago", wrote one netizen.

Propaganda aside, many residents of Yunnan are dejected. Ruili, in particular, suffered during the pandemic. It was subjected to some of the most severe and extensive lockdowns in China. Over the past three years the population shrank by more than half, to 200,000, as people fled to other parts of the country, says a local official. Adding to the decline, some citizens of Myanmar were forcibly repatriated. Others tried and failed to tear down the border wall, say locals.

Now the long way is the only way

The people who have remained in Ruili report that their lives have become much harder. Take the watermelon farmer, who would hop across a river to manage his land in Myanmar before the pandemic. Now he must travel 30km east to cross the border at an official post, then 30km back to reach his land. He has not seen his family in Myanmar since 2020.

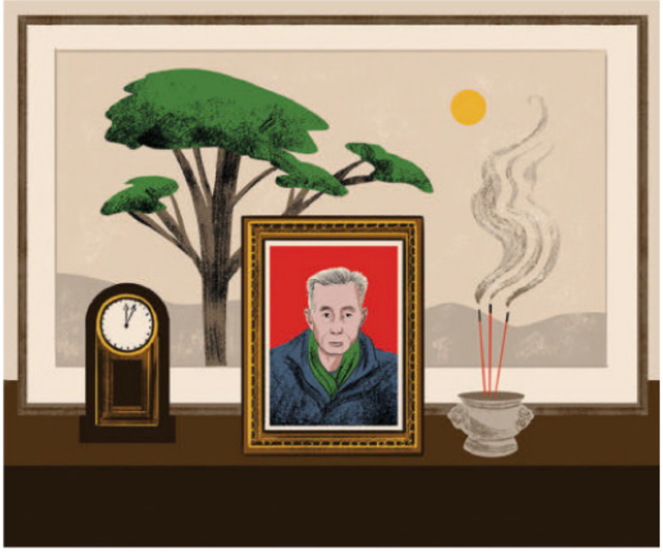
Others have lost their livelihoods running innocuous goods, such as cosmetics or snacks, from one side of the border to the other. Unemployment has increased on both sides, say locals. Goods from Myanmar now must go through authorised channels, where officials apply customs duties. Prices have therefore risen, say traders. One in Ruili complains that the cost of jadeite—the rock which is cut and polished into jade jewellery—has doubled.

Locals are nostalgic for the days when international travel amounted to walking across a field or through some woods. But many seem resigned to the hardened border. "The wall is here to stay," says a businessman in Ruili. "At the beginning I felt strongly about it. Now I'm just numb." ■

A great wall only to some

Chaguan | Chairman Mao’s last victims

As they grow old, witnesses to the Cultural Revolution speak out



For any regime bent on forgetting past horrors, the last surviving victims are a troublesome group. As they grow old, those who suffered or witnessed acts of political violence become harder to cow into silence. China’s Communist Party faces such a moment. Even the youngest participants in the Cultural Revolution will be turning 70 soon. While there is time, some survivors are speaking out about that deadly decade of purges and bloodletting, unleashed in 1966 by Chairman Mao Zedong as a way to outflank critics within the party establishment. Unfortunately for such survivors, the collective interests of the ruling party and thus the nation, as defined by the supreme leader, President Xi Jinping, leave little room for individual pangs of conscience.

School textbooks offer only terse accounts of the 1960s and 1970s, declaring that Mao’s mistakes are outweighed by his achievements. Mr Xi denounces “hostile forces” at home and abroad for what he calls “historical nihilism”. By that he means dwelling on dark episodes from the past to shake the public’s faith in the party’s leadership. For some older Chinese, calls to forget are appealing. For others who suffered in the Mao era, party-ordained amnesia is cruel: a life sentence of pain without parole.

To better understand this moment, Chaguan spent time with a family first condemned as “counter-revolutionary” more than 70 years ago. In 1949 the end of China’s civil war found the Wang family of Shishi, a village set in the wooded hills of Jiangxi province, on the wrong side. Its patriarch was a lieutenant-colonel in the Nationalist army defeated by Communist forces. He was sentenced to hard labour. His only child—the idealistic, bookish Wang Kangfu—became a schoolmaster at the age of 17, teaching Chinese literature in a rural primary school. The younger Wang was 24 years old when the Cultural Revolution began. Soon afterwards police and revolutionary enforcers from a “socialist education work group” took him from his classroom. The investigation report used at his subsequent trial begins with his class background. It charges him with opposing Mao’s policies, reading classical literature under his father’s counter-revolutionary influence and teaching children to be spies. After listing his political crimes, it accuses him of raping and assaulting female students as young as 12 and complains of his “cunning” refusal to admit his guilt.

Wang was convicted of two counts of rape and ten counts of harassment. He was sentenced to ten years in a labour camp. Released in 1975, he continued to insist on his innocence. He was introduced to another class enemy, Zhou Sanying, the daughter of a landlord who had fled to Hong Kong, then a British colony. Locals felt they would be a good match. The two married in 1977, a year after Mao’s death in effect ended the Cultural Revolution. Though it was perilous to doubt the decisions of revolutionary courts, Shishi’s village school hired Wang as a substitute teacher, a low-paid job that he would hold for many years. He would go on to have four children, but devoted most of his energies and meagre income to seeking a retrial or exoneration.

Wang came close to clearing his name a few years after Mao’s death. It was a time of relative openness, when it suited economic reformers at the top of the party to allow some discussion of crimes committed by leftist zealots. Taking a risk, he wrote to ex-pupils whose testimony convicted him. In all, he found ten of the 12 students cited as witnesses. In letters and affidavits, all said he was innocent, including both pupils named as rape victims. Some replied that they did not know that they had accused him of rape, or described being coached to denounce him. In 1980 a well-connected relative secured a review of his case by a local court. As his youngest daughter, Wang Zhenzhen, recalls, the review described a “classic case concocted during the socialist education movement”. But his hopes were dashed. First a county-level judge privately questioned his insistence that he wanted no financial compensation. Then a higher court rejected his appeal, accusing him of colluding with witnesses. The teacher persisted for four lonely decades, rising before dawn to write hundreds of letters to courts, prosecutors and national leaders.

By any legal standard, a case deserving of retrial

Wang’s loneliness eased in recent years. Lawyers offered free advice, calling the prosecution evidence shockingly weak. Chinese journalists interviewed him, testing the boundaries of censorship. Seeing those reports, his ex-pupils rallied round to collect fresh statements. The classmates “all felt he was wronged”, says one of them, a sprightly 71-year-old retired forestry worker. Taking Chaguan to meet one of two women named as rape victims in 1966, he admitted that female classmates are tired of speaking about the case, fearing gossip from neighbours. The woman confirmed her statements that Wang is innocent, then retreated indoors, saying that the subject makes her husband and grown-up son unhappy.

A grave blow came in January 2022, when China’s chief prosecutors declined to reopen the case, citing a lack of new evidence. Wang’s wife does not begrudge him his 44-year-long campaign, though their cement-floored home is chilly and damp, forcing her to wear a thick coat and purple woollen hat indoors. She admits that the case robbed the family of a normal life, so that their home “was not like a home”. At times poverty drove the family to eat rotten vegetables and meat from pigs culled because of swine fever. But she calls her husband a good and kind man. She compares him to a vacuum flask, cold on the outside but warm within. “I have to support him, it’s such an unjust case,” she says.

For China’s rulers, such persistence is inconvenient, but time is on their side. Wang died last October, aged 80. His photograph sits on a dresser, flanked by funeral couplets, incense sticks and a black-and-white portrait of his father, the Nationalist colonel. The authorities can wait. Soon the Cultural Revolution will be known only through history books, and the party writes those. ■

Russian diplomacy

Potemkin lives

ANKARA, BEIJING, BUENOS AIRES, DAKAR, DELHI, JOHANNESBURG AND SÃO PAULO

On paper, Russia retains plenty of allies and influence. In practice, its friends are a motley—and shrinking—crew

“The West’s plans to isolate Russia by surrounding us with a sanitary cordon have been a fiasco,” Sergei Lavrov, Russia’s foreign minister, gloated recently. “We are strengthening good neighbourly relations…with the international majority.” At first glance Mr Lavrov seems to have a point. On February 23rd, the day before the first anniversary of Russia’s invasion of Ukraine, 39 countries refused to back a UN resolution condemning it. Despite America and its allies imposing sanctions, Russia’s economy and trade have held up surprisingly well. Mr Lavrov himself, meanwhile, has merrily racked up plenty of air miles visiting foreign capitals.

On paper, Russia’s geopolitical clout looks impressive. It has troops and mercenaries posted to at least 16 other countries. Some prop up friendly autocrats, as in Mali and Syria. Others sustain “frozen conflicts” that keep countries such as Georgia in line and out of NATO. Over the past decade Russia has accounted for more than half of arms imports in 22 different countries, including big ones such as China and India. At the UN it has benefited from the support, or at least useful abstentions, of dozens of countries.

Natural resources and technology amplify its power. In the decade before the invasion Russia was the dominant natural-gas supplier to more than a dozen countries, giving it an energy weapon that it has not hesitated to wield against Europe: in 2005, 2009 and again last year. Ten countries generate a major share of their electricity from Russian-built nuclear reactors, or else co-operate closely with Russia on nuclear technologies.

Russia’s diplomatic resilience has many in the West wringing their hands. Peter Frankopan, a history professor at Oxford University, recently wrote that resentment at the West and sky-high energy prices were transforming the international system in ways that favour Russia. Newspapers, think-tanks and pundits lament that the West has failed to isolate Russia or win over large numbers of developing countries. Yet data collated by *The Economist* on a broad array of military, economic and diplomatic measures—call it the “Putin’s pals index”—show a fuzzier picture (see table on next page).

The index looks at 11 different measures of support or potential for coercion in three broad areas. The first set is military. Are they treaty allies with Russia? Do they have Russian troops or mercenaries on their territory? Have they supplied arms to Russia since the war began? Do they depend on Russian arms? Have they done manoeuvres with Russia since the start of the war? The second is diplomatic. Have countries voted against Russia or abstained on key UN resolutions, or voted with it at least twice on these resolutions?

The third set looks at energy and economics. Do they rely on Russian gas, and do they depend on Russian nuclear-power stations or technology? Is trade with Russia a large share of their total trade? Have exports to Russia risen since the war?

The categories are unweighted, so countries are scored on a simple total. This rough-and-ready index is not intended to capture the finer nuances of diplomatic stances that many countries adopt. But it provides a framework for assessing a country’s relationship with Russia and whether it could be vulnerable to coercion. (Readers wanting to browse the full index can download the full dataset from “economist.com/PutinsPals”.)

The half a dozen countries that score most highly are those bound to Russia mainly by politics, history and geography,

▸▸

such as Armenia, Belarus, Iran and Kyrgyzstan. Beneath these is a long list of countries with looser links to Russia, including giants such as China and India and tiddlers such as Eritrea and Nicaragua.

One way to think about the universe of countries with links to Russia is to group them into three categories: a "coalition of the failing"; the "Soviet remembrance society"; and an "axis of opportunists".

The B Team

Start with the coalition of the failing. Vladimir Putin is fond of quoting Tsar Alexander III: "Russia has just two allies: the army and the navy." That is closer to the truth than Mr Putin might like. On paper Russia has five formal allies in the Collective Security Treaty Organisation (CSTO): Armenia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan. All are bound by treaty to come to each other's aid if attacked. Yet not one CSTO member has backed Russia's war in Ukraine with troops, though Belarus has let itself be used as a military base.

Instead, some CSTO members are trying to distance themselves from the war. Armenia is angry that the 3,500 Russian troops on its territory did not come to its aid during a war with Azerbaijan in 2020. It has refused to host this year's CSTO war games, and now seems to be hedging its bets when it comes to political patrons, by inviting an EU mission to monitor its border with Azerbaijan.

Kazakhstan has long been a close ally of Russia. Last year Mr Putin sent troops to the country to put down anti-government protests. Yet that did not stop Kassym-Jomart Tokayev, Kazakhstan's president, from criticising the Ukraine war in front of Mr Putin during a visit to St Petersburg in June. In February Kazakhstan hosted Antony Blinken, America's secretary of state. Mark Galeotti of the Royal United Services Institute (RUSI), a think-tank, draws parallels with Britain's post-imperial decline. Central Asia's drift away from Moscow, he wrote, is "Putin's Suez moment".

Besides Belarus, only Iran and North Korea have sent arms to Russia. America's government reckons North Korea has delivered a "significant" number of artillery shells, but not enough to alleviate Russia's shortage or change the course of the war. Iran has sent explosive-laden drones that have helped Russia keep bombing Ukraine, even as its own stocks of missiles have run low. It has also posted "military advisers" to help Russia operate the drones.

Yet Iran, which was determinedly non-aligned during the cold war, is divided over how much to cosy up to Moscow. Hardliners in the Islamic Revolutionary Guard Corps hope their support will be repaid with modern fighter jets and anti-aircraft missiles. But relative moderates in Iran's foreign ministry worry about further antagonising the West or condoning the invasion of neighbouring countries—particularly since the Soviet Union conquered much of Iran during the second world war. Set against this group of three allies willing to arm Russia is a Western alliance of 31 countries that have publicly confirmed they are sending weapons to Ukraine.

Diplomatically, Russia seems almost as isolated. Only four countries (Belarus, Nicaragua, North Korea and Syria) have voted consistently against the seven UN General Assembly resolutions that have condemned Russia's behaviour in Ukraine since 2014, when its troops seized the Crimean peninsula. Another half dozen, including Bolivia, Eritrea and Mali, have voted with Russia at least twice.

Countries in the coalition of the failing have much in common. None is a proper democracy. Some, such as Syria, depend directly on Russian troops or mercenaries for the survival of their governments. Others, such as Eritrea, are themselves global pariahs that rely on Russia for diplomatic support in the UN Security Council. The coalition is also shrinking. In 2014, when the UN voted to condemn the annexation of Crimea, Russia had the support of ten countries. Several have since withdrawn their backing. These include Bolivia, previously under the thumb of Evo Morales, a leftist strongman, and Sudan, which was ruled by Omar al-Bashir, a genocidal dictator who hated the West.

Roughly 30 other countries are nominally neutral and tend to abstain on UN votes on Ukraine. Many refuse to take sides, says Dmitri Alperovitch, the head of Silverado Policy Accelerator, an American think-tank. Instead, he says, their attitude is: "a pox on both your houses; this is two white countries fighting each other."

Goodbye Lenin

A subset of these make up the Soviet remembrance society. While not offering any serious diplomatic or military help, they tend to lean towards Russia, doing such things as holding military drills with its armed forces or echoing its arguments that NATO expansion or Ukraine itself is to blame for the war.

Untangling their motives is not always easy, but some common threads emerge. Some countries, such as Algeria, Angola and South Africa, profess sympathy for Russia partly because of historical links to the Soviet Union (they seem to forget that Ukraine was also part of the USSR); or, even more ironically, because they remember the USSR as an ally of oppressed people fighting imperialists.

Yet Soviet nostalgia is not the only factor at play, particularly in Africa, where most of the countries abstaining on the key UN votes are found. In many cases ruling parties or politicians owe Russia favours for its help in financing or trying to sway elections. South Africa's ruling African National Congress, for instance, has taken large donations from a mining firm linked to Russia. That may have influenced its decision to host Mr Lavrov and to hold military exercises with the Russian navy.

Russian diplomacy in Africa focuses on security assistance and weapons sales. The Atlantic Council, a think-tank in Washington, noted in a recent report that whereas Russia had signed seven military co-operation agreements in Africa between 2010 and 2017, it inked 20 between 2017 and 2021. More than half of the recent crop were with countries with which Russia had no previous military ties.

Russia is not just a big supplier of weapons. It has also become the arms dealer of last resort, gaining influence in countries ▸▸

Putin's pals

Geopolitical closeness to Russia*, by category, March 2023

Ranking (out of 12 countries)	**Military** (out of 5)	**Diplomatic** (out of 2)	**Economic** (out of 4)	**Total score**
1 Belarus	5	2	4	**11**
2 Armenia	4	1	4	**9**
3 Kyrgyzstan	4	1	3	**8**
=4 Iran	3	1	2	**6**
=4 Tajikistan	4	1	1	**6**
=4 Kazakhstan	3	1	2	**6**
=7 Syria	3	2	0	**5**
=7 China	2	1	2	**5**
=7 Venezuela	3	1	1	**5**
=10 Nicaragua	2	2	0	**4**
=10 India	2	1	1	**4**
=10 Uzbekistan	0	1	3	**4**

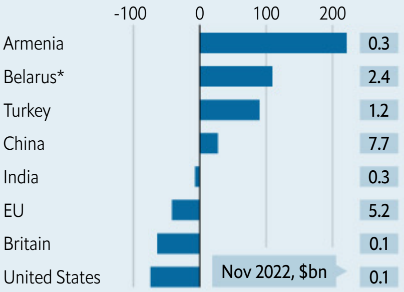
*Based on 11 measures of support for Russia or potential for coercion, latest data

Sources: CEIC Data; CSIS; Global Trade Tracker; IEA; IISS; IMF; Lowy Institute; K. Szulecki and I. Overland, 2023; Silverado Policy Accelerator; SIPRI; UN; UN Comtrade; *The Economist*

Trading places

Average monthly exports to Russia, Feb-Nov 2022

% change from Jan 2019-Jan 2022



*Nov 2022, % change from Nov 2019

Source: Silverado Policy Accelerator

that are cut off from Western supplies because of coups and human-rights abuses, such as Mali and the Central African Republic. Western arms embargoes "opened the door [for the Russians]," says J. Peter Pham, America's special envoy for the Sahel under the Trump administration. "We can't really blame the Malians for taking what they can get."

Yet in some cases Russia's attempts to win influence have failed spectacularly. Madagascar, for instance, turned against Russia after it was caught trying to swing a presidential election towards pro-Russia candidates in 2019. After five fighters from Wagner, a Russian mercenary firm, were captured and beheaded by jihadists in Mozambique, the country turned to Rwanda and the West for security assistance.

"Everywhere they go, they seem to be struggling in terms of political interference," says Samuel Ramani, also of RUSI and the author of "Russia in Africa", a book published last month. The mistakes Russia makes in poor countries are often similar to its intelligence blunders in Ukraine, such as overestimating the popularity of local proxies or leaders. "Most of it is general incompetence, and also a misreading of local situations," says Mr Ramani.

Nuclear energy offers Mr Putin another potential lever. Rosatom, Russia's state-owned nuclear-energy firm, is the world's biggest exporter of reactors. A paper published in *Nature Energy* last month by Kacper Szulecki and Indra Overland at the Norwegian Institute of International Affairs notes that at least nine countries, including Bangladesh and Egypt, could be vulnerable to political pressure because they depend on Russian-built or operated nuclear plants. Several other countries have high levels of nuclear co-operation with Russia. Yet this, too, may be weakening. Russia's interruption of gas exports to Europe may undermine its general reputation as a reliable supplier of energy.

The third group of countries—the axis of opportunists—see Western sanctions as a chance to boost their own trade with Russia on juicy terms. Russian imports of goods collapsed by more than 40% in the first few months after its invasion, according to an analysis by Silverado Policy Accelerator. Yet by September they had largely recovered, as China and Turkey in particular stepped in to replace exports from Europe and America (see chart). The West has so far proved unable to completely shut down Russian imports of high-tech widgets such as computer chips, which are used in missiles and other weapons. Russia has continued to import between a third and a half as many chips as it did before the war started, largely thanks to a big increase from China.

China initially seemed to have been caught off-guard by Russia's attack on Ukraine. It had agreed to a strategic partnership with "no limits" just weeks before the tanks rolled in. Since then China's supreme leader, Xi Jinping, has sought to turn the situation to his advantage, sensing an opportunity to distract America from its efforts to confront China, especially over Taiwan.

Yet at the same time, Mr Xi has calibrated his response to try to insulate China from any American or allied retaliation. Chinese officials thus profess neutrality on Ukraine, refusing to condemn Russia's invasion but blaming the war on NATO's expansion since the end of the cold war. One big question is whether China will begin supplying weapons to Russia for use in Ukraine. That could relieve Russian shortages of ammunition, and perhaps change the course of the war. More may be revealed when Mr Xi visits Russia, which could be as soon as next week.

Turkey's relationship with Russia is more complex. Turkey is a NATO member. It has sold armed drones to Ukraine and is thought to have sent precision-guided artillery and rockets too. It competes with Russia for influence from the Middle East to Central Asia. It has fought proxy wars against it in Syria and Libya. Yet it also relies on Russia for gas and help building nuclear-power plants. It earns billions of dollars a year from Russian tourists. This locks both countries into mutual dependence. Turkey finds it advantageous to play Russia and the West against each other. Russia, in turn, seems willing to overlook Turkish support for Ukraine so long as trade continues to flow.

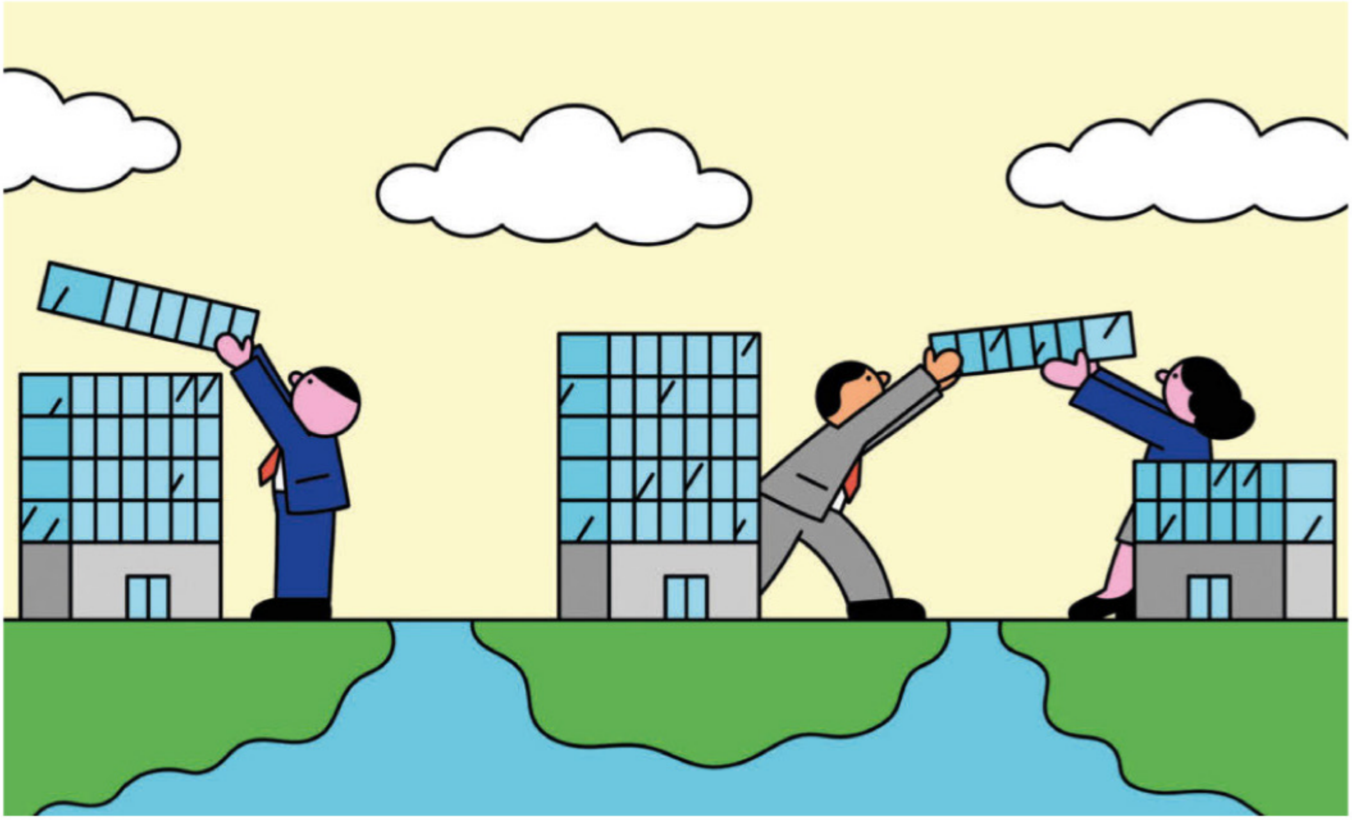
India could be benefiting far more from trade with Russia than it is. It has studiously refused to condemn Russia's invasion and has increased its imports of discounted Russian oil (though now says it will stick to a price cap imposed by the West). It remains a big buyer of Russian weapons. Yet at the same time it does not seem to have become a critical conduit for getting goods under sanctions into Russia. Indeed, the value of India's exports to Russia has fallen since the invasion.

Picking battles

The West has been trying to tug some of Putin's remaining pals away. It has deterred countries such as Belarus from playing a more active part in the war, and Iran from supplying ballistic missiles. But Ukraine's allies have floundered over how—or even whether—to counter Russian influence in poor countries.

The first step may be to avoid over-inflating the importance of the soft support offered to Russia by its fellow travellers—particularly when it leads to little more than abstentions on UN votes or other symbolic gestures of solidarity. "I worry about setting ourselves up for an unprofitable game of whack-a-mole if we try to counter each and every manifestation of Russian influence," says Andrew Weiss, a Russia specialist at the Carnegie Endowment for International Peace, an American think-tank. "In some cases, we risk overpaying to deal with problems that don't have all that much strategic importance."

At the same time the West could be taking relatively cheap steps to counter the spread of Wagner in Africa. One option would be to help arm and support regional security forces and friendly governments so that they are not forced to turn to Russia to provide security. Similarly, when dealing with Russia's axis of opportunists, the West needs to carefully calibrate its own red lines, spell them out and not protest at increased trade outside of military and high-tech goods. It should keep its economic powder dry to deter China or others from sending arms and ammunition. A year after Mr Putin's invasion, Russia is not as isolated as some in the West had hoped. But Mr Lavrov's claim that it is surrounded by close friends is wide of the mark. ■



Global corporations

The multipolar company

Being a multinational in a nationalist world

Twelve months ago Russia joined the ignominious list of countries—alongside North Korea and Cuba—where consumers are denied the joys of a Coca-Cola. The American beverage giant had halted its operations there following the Russian invasion of Ukraine. Thirty years before, when Coca-Cola expanded in Russia after the collapse of the Soviet Union, barriers to global commerce were being torn down. Today they are being re-erected—and not just around Russia.

America's Treasury Department is reportedly working up plans to stop outbound investment in cutting-edge technologies in adversarial countries. It has already banned the sale of advanced microprocessors and chipmaking equipment to China. Sino-American commerce could snap shut entirely if China imitates Russia's belligerence in its relations with its own coveted neighbour, Taiwan. At the same time, America is dangling subsidies worth half a trillion dollars with the aim of bringing supply chains for semiconductors, electric cars and clean energy back home. The European Union is expected to unveil a chunky package of similar sweeteners any day now.

Operating as a multinational company has always involved difficulties, from coordinating across time zones to navigating a patchwork of regulatory regimes. The latest strains on globalised commerce—wrought by geopolitical tensions and rising protectionism—raise tricky questions for the corporate giants of the West that have been among globalisation's biggest beneficiaries. Their initial responses sketch out the contours of the Western multinational of the 21st century. It is less reliant on China and more reliant on intangible assets such as software and patents. But overall, it is no less global.

Western firms started spreading out into the world in the 1600s, when Europe's colonial trading houses ventured (often violently) beyond the old continent in search of commercial opportunities. By the start of the 20th century the global stock of foreign direct investment (FDI), a rough proxy for the prevalence of multinational businesses, was hovering at 10% or so of world GDP.

Then, around the time Russians took to glugging locally made Coke, the West's corporate globetrotters experienced their own carbonated high. Free trade, lower shipping costs and better communications technology allowed them to become more truly global. They set up shop wherever they could find cheaper labour, lower taxes or new customers. In the early 2010s the worldwide stock of FDI reached the equivalent of 30% of global output. Western businesses accounted for 78% of the total. The average American multinational had a dozen foreign subsidiaries.

In the past decade or so things started to change. American and European companies began to lose some of their foreign fizz. Banks battered by the global financial crisis of 2007-09 and the ensuing euro-zone debt rigmarole slimmed down their ▸▸

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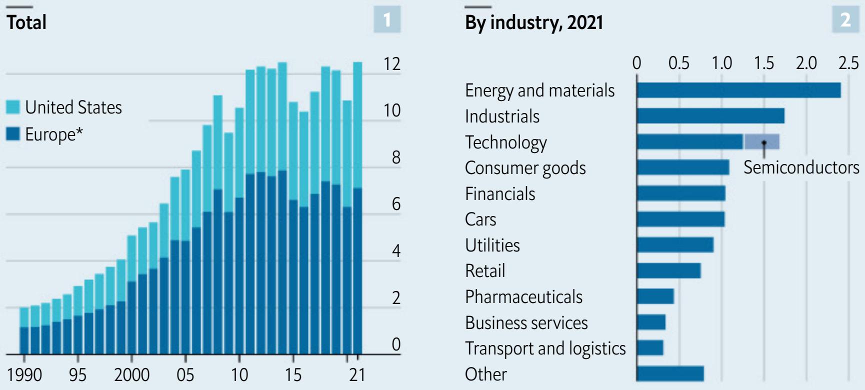
Crawling giants

Listed companies' foreign revenues

Europe* and United States, $trn



Sources: Refinitiv; *The Economist*

*Britain and euro area

foreign businesses. And new competitors, especially from China, began to challenge Western firms. Four of the five biggest smartphone brands in India, for example, are now Chinese. Last year China overtook Germany as the world's second-largest car exporter, behind only Japan.

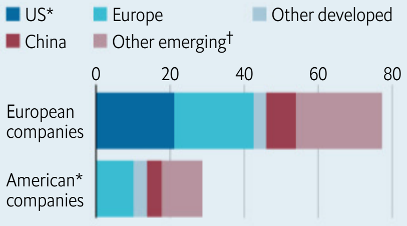
Since 2010 the foreign sales of listed American and European companies have grown by a meagre 2% per year, down from 8% in the 2000s and 10% in the 1990s (see chart 1). Multinationals have been adding fewer foreign factories to the FDI stock. Annual flows of American and European foreign investments (excluding reinvested earnings) plunged from a peak of $659bn in 2015 to $216bn in 2021, according to the United Nations Conference on Trade and Development—and that was an uptick from $156bn in 2019, before covid-19 quashed them almost completely in 2020. Between 2010 and 2021 the West's share of the worldwide FDI stock fell from 78% to 71%. The typical American multinational now has just nine foreign subsidiaries.

Politicians on both sides of the Atlantic applaud this trend. They are talking up a domestic manufacturing renaissance and increasingly trying to keep China, the West's factory turned foe, down. In January monthly spending on factory construction in America hit $10.9bn, up by 55% on the year before. The EU hopes its new subsidies will have a similar effect.

Plenty of fish

Listed companies' foreign revenues by market

2022 estimate, % of total revenues



Source: Morgan Stanley

*Includes Canada
†Includes eastern Europe

America Inc and Europe SA are also cooling on China—both as maker of and market for their wares. According to BEA data, the value of American multinationals' factories and equipment in China peaked in 2018. Western politicians may claim the credit for this change, but a bigger reason may be pricier Chinese labour. Since 2010 manufacturing wages in China have increased four-fold, from $2 per hour to over $8 in nominal terms.

As for the Chinese market, it remains important for some sectors. Western semiconductor companies, for example, derive around 30% of their sales from China. But chipmaking accounts for just $400bn of the $12trn of sales generated abroad by listed Western companies (see chart 2). Look across all industries, and China is responsible for less than one-eighth of Western firms' foreign revenues, according to Morgan Stanley, an investment bank—a much smaller share than American and European sales across the Atlantic or to the rest of the emerging world (see chart 3). Only 8% of European companies' total revenues come from China. For their American counterparts, the figure is 4%. According to BEA figures, American multinationals' sales in China were flat between 2017 and 2020. In India they grew by 6% a year in the same period.

Western multinationals are, then, becoming somewhat less Chinese. Yet it would be a mistake to conclude that they are turning into homebodies. In so far as the "reshoring" of production from China is happening, observes Arend Kapteyn of UBS, a bank, it is mostly confined to a narrow set of favoured sectors. Overall manufacturing output remains below what it was before the financial crisis in America and roughly unchanged in Europe, after adjusting for inflation.

Indeed, Western business looks the opposite of world-weary. American firms may have a quarter fewer foreign subsidiaries than a decade ago, on average, but the drop was more than offset by the number of them with a presence abroad. This swelled from 2,300 in 2010 and to over 4,600 in 2020, BEA data show. On March 13th it was reported that Chick-fil-A, an American fast-food chain, plans to spend $1bn on expansion in Asia and Europe.

The biggest firms maintain a large foreign presence. General Motors, a Detroit carmaker, still boasts more than 100 foreign subsidiaries. Most of Chick-fil-A's new foreign diners will be able to wash down chicken sandwiches with Coca-Cola, which continues to quench thirst in more than 200 countries and territories.

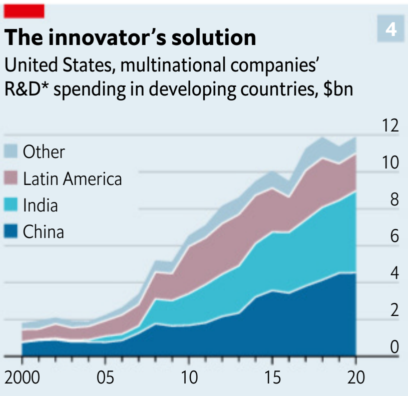
Western business is not giving up on foreign production, either. Apple and Adidas are increasingly sourcing their iPhones and sneakers, respectively, from geopolitically friendly places like India and Vietnam, where wages are roughly a third of those in China to boot. This month Elon Musk announced that Tesla would build a new factory in Monterrey, Mexico, another low-wage location with the added benefit of being next door to the car company's home across the border in Texas.

The world is still your Coke can

Those globetrotters are increasingly after more than merely cheap manual labour. Technological progress means that many firms' most productive assets are now not their physical plant and equipment but intangibles like computer programs and patents. This increases the returns on investment in talent, especially in places where an educated workforce commands lower wages than in the West. Technologies such as speedier broadband, video calls and cloud computing make this talent pool easier than ever to tap. Richard Baldwin of the Geneva Graduate Institute predicts that the offshoring of white-collar work will ▸▸

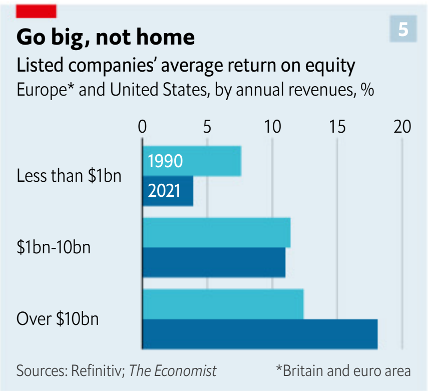
The innovator's solution

United States, multinational companies' R&D* spending in developing countries, $bn



Sources: Bureau of Economic Analysis; *The Economist*

*Research and development



Go big, not home

Listed companies' average return on equity

Europe* and United States, by annual revenues, %

Sources: Refinitiv; *The Economist* *Britain and euro area

form the basis of a new wave of globalisation akin to the dispersion of manufacturing in earlier decades.

Multinationals have already begun to think more expansively about what tasks can be done offshore, notes Jimit Arora of the Everest Group, a consultancy. American multinationals' spending on research and development (R&D) in low-cost countries roughly doubled between 2010 and 2020 (see chart 4 on previous page). Last November Boeing, an aircraft manufacturer, announced it would build a $200m R&D facility in the Indian city of Bangalore, its largest outside America. American tech giants such as Alphabet, Amazon and Microsoft have also opened R&D centres in the city. So has Walmart, America's mightiest supermarket chain, and Rolls-Royce, a British maker of aircraft engines.

The importance of intangibles will only grow as businesses across the economy reinvent themselves for the digital era. Siemens, a German industrial giant, already calls itself a "technology company" focused on digital simulations, data analytics and so on. Walmart now employs some 25,000 tech specialists, equivalent to the combined workforce of Pinterest, Snap, Spotify and Zoom, four tech darlings.

Because software tends to be expensive to build but cheap to reproduce, big firms that can spread the fixed costs of development enjoy an ever greater competitive advantage. And multinational companies can spread those costs widest of all.

Between 1990 and 2021 the average return on equity of American and European listed companies with less than $1bn in sales fell from 8% to 4%. That for firms with revenues of $10bn or more rose from 12% to 18% (see chart 5). And being big is easier if you are international. In 2021 American and European listed companies with $10bn-plus in revenue generated 43% of their sales abroad on average, compared with just 32% for those with sales below $1bn. Global reach is, in other words, more important than ever. With ambitious emerging-market rivals nipping at their heels, retreat is not an option for the West's corporate champions. ■

Bayer

An American in Leverkusen

BERLIN

Shareholders have high hopes for the drug-and-chemicals giant's new boss

AFTER BILL ANDERSON, Bayer's new boss, arrives on April 1st at the firm's headquarters in Leverkusen, Werner Baumann, the German drug-and-chemicals giant's outgoing chief executive, will be on standby for two months to ensure a smooth transition. Given Mr Anderson's lack of experience in crop sciences, Bayer's biggest business, you might ask what the board was thinking handing him the reins. The answer is that he has two qualifications that make up for his shortcoming. He used to run the pharmaceuticals business at Roche, a Swiss drug behemoth. And he is American. That makes him just the man for a company that is betting big on its pharma business across the Atlantic.

Mr Anderson will need to get up to speed with three challenges facing Bayer. He must deal with the legacy of Mr Baumann's ill-fated $63bn takeover in 2018 of Monsanto, an American crop-chemicals firm. Then there are Bayer's transatlantic ambitions. By the end of the decade it wants to double its drugs sales in America, the world's biggest market—and launch new treatments to replace blockbusters like Xarelto, a blood-thinner whose patent protection expires this year. Last, Mr Anderson needs to deal with calls for a split of Bayer's pharma and crop-science businesses, or at least a sale of the consumer-health unit, which makes Aspirin, Alka Seltzer and other non-prescription staples.

Mr Baumann left the top job a year earlier than planned amid growing discontent of investors, whose shares have lost a third of their value during his seven-year tenure. Much of the €26bn ($27bn) fall in Bayer's market value over that period is attributed to the Monsanto takeover. The costly acquisition made lots of business sense for Bayer, which already had a crop business. But Mr Baumann misjudged the potential cost of Americans' litigiousness: Monsanto makes Roundup, a weedkiller that contains glyphosate. Bayer has been inundated with 154,000 lawsuits from people who claim that glyphosate causes cancer. Bayer denies this and has the backing of many scientists. But to make the matter go away, it has paid out $9.5bn in settlements with 109,000 plaintiffs, and has set aside another $6.4bn for the rest.

The Monsanto experience has not put Bayer off the American market. The firm has 30,000 staff at 150 sites in America, making it one of the country's biggest life-science firms, says Patrick Lockwood-Taylor, head of Bayer's American business. Its three American units (including Monsanto) made up 40% of the company's revenue last year. To reach the ambitious goal of doubling its $5bn American drug business Bayer is planning to beef up staff in marketing and distribution from 1,000 to 3,000 by 2030. Last year it opened a $140m research centre for molecular biology near ▸▸

Bayer's transatlantic bet

Boston. It has high hopes in America for two recently launched drugs: Nubeqa, a treatment for prostate cancer, and Kerendia, for diabetics with kidney disease.

Mr Lockwood-Taylor insists that Bayer has no plans to sell its consumer-health business, let alone split in two. That will not silence calls for a separation. Two activist investors, Inclusive Capital and Bluebell Capital, bought into Bayer at the start of the year. Jeffrey Ubben, boss of Inclusive, which owns more than €400m-worth of shares, calls the crop unit a "jewel" at times of heightened fears over food security. As a separate firm, he argues, its valuation could be similar to that of Corteva, the agriculture business spun off in 2019 from DowDuPont, an American chemicals giant. Corteva is trading at 20 times earnings, well ahead of Bayer, with a ratio of seven.

A stand-alone drug business, meanwhile, may be better off without the legal risks related to Roundup. Other pharma spin-offs, as when Switzerland's Novartis hived off its generics unit or America's Pfizer sold its animal-health arm, have worked out well.

The 56-year-old Mr Anderson is ambitious: he quit Roche last year after being passed over for the top job. He is also a risk-taker: at Roche he bet big on three costly trials of drugs to treat Alzheimer's disease, breast cancer and lung cancer, despite unpromising results in early clinical studies. The trials failed. Bayer's shareholders will be hoping that Mr Anderson will bring to Leverkusen a trait more typically associated with Ireland—luck. ■

The Adani Group

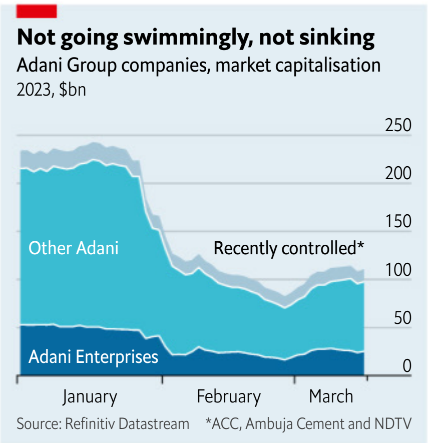
Uncapsized

MUMBAI

India's embattled tycoon appears to be regaining his footing

When a New York short-seller's report wiped some $150bn, or two-thirds, from the combined value of the Adani Group's listed holdings in late January and early February, several big questions were keeping India Inc up at night. Would Indian banks and insurance companies with significant exposure to the ports-to-power conglomerate also teeter? Would the contagion spread to the rest of the Indian financial world? And would India's government pursue an aggressive investigation into the short-seller's allegations of fraud and stockmarket manipulation, which set off the imbroglio (and which the Adani Group vehemently denies)?

A month and a half on, the answers to the first two questions are, happily for India, "no". The answer to the third is less categorical, and somewhat less constructive: the government seems in no rush to settle the matter, perhaps because the Adani firms' modest free float means a small number of mostly big shareholders bore much of the pain and no angry mob of retail investors is pressing Delhi to get to the bottom of it, fast. With those big questions out of the way, attention has turned to the next conundrum: can the Adani Ggroup and its eponymous tycoon founder, Gautam Adani, recover? Or will they founder, possibly dragging the Indian government's grand plans for investments in infrastructure and green energy down with them?


Not going swimmingly, not sinking
Adani Group companies, market capitalisation
2023, $bn

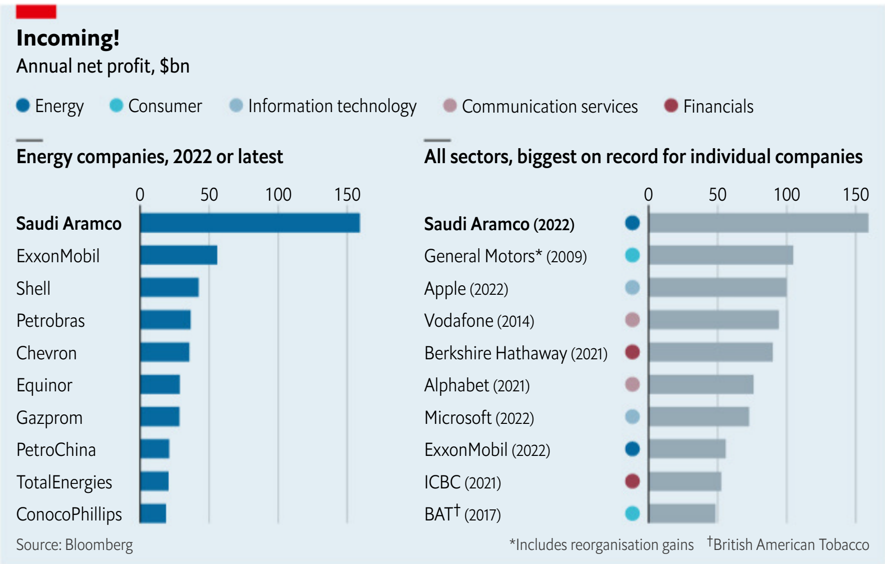
Source: Refinitiv Datastream *ACC, Ambuja Cement and NDTV

The past month has offered hope to those rooting for Mr Adani and his businesses, which operate some of India's biggest ports and airports, store a third of its grain, run a fifth of its power-transmission lines, produce a lot of its cement—and have their eye on clean hydrogen and steel-making, among other ventures. The group's total market value has climbed back to more than $110bn, from a low of $82bn. That of its flagship public company, Adani Enterprises, is up by 54% from its nadir on February 27th. The yields on bonds issued by some Adani firms have come down from levels indicating distress.

The big turn in the Adani Group's fortunes came in early March, after GQG Partners, a fund that is based in America, listed in Australia and run by an Indian, bought $1.9bn in shares of several of the group's companies directly from the Adani family. At the time, GQG's boss, Rajiv Jain, who lives in Florida, told the *Financial Times* that "the market was mispricing Adani" and praised the conglomerate's "very competent management" and "fantastic" execution capabilities.

Mr Adani used the proceeds to help repay $2.1bn in margin loans that used Adani companies' shares as collateral, relieving one possible source of financial stress. Another $1.1bn, half coming from the Adani family and half from the Adani businesses' cashflows, was used to meet other near-term obligations. These moves reduced the group's outstanding debt by just 4%, to $27bn. But they eased pressure and reassured the market. So did the acquisitive conglomerate's decision to pause new capital investments, beyond those it had already pledged, until September 2024, and to put big takeovers on hold.

As these demonstrations of financial discipline were taking place, the Adani ▸▸


Incoming!
Annual net profit, $bn

Source: Bloomberg *Includes reorganisation gains †British American Tobacco

Aramco's princely profit

The world's energy supermajors had a bountiful 2022. ExxonMobil, the largest of the private-sector giants, reported a record annual net profit of $56bn, after Russia's invasion of Ukraine sent oil prices soaring. Mouth-watering—unless you are Saudi Aramco, in which case it's peanuts. Last year the desert kingdom's oil giant brought in some $160bn of net income, the most by any company in corporate history.

Bartleby Mega lowdown

From high-speed rail to the Olympics, why big projects go wrong

Lots of countries have big construction projects that become a byword for ineptitude. In America the “Big Dig”, a highway project that snarled up the centre of Boston for years, came in five times over its initial budget. The stadium built for the Montreal Olympics in 1976 was unaffectionately known as the “Big Owe” after costs overran massively; the debts from the games were paid off only 30 years later. Even the Germans get megaprojects wrong. Ground was broken at Brandenburg Airport in Berlin in 2006, and the first flights took off in 2020, ten years later than scheduled.

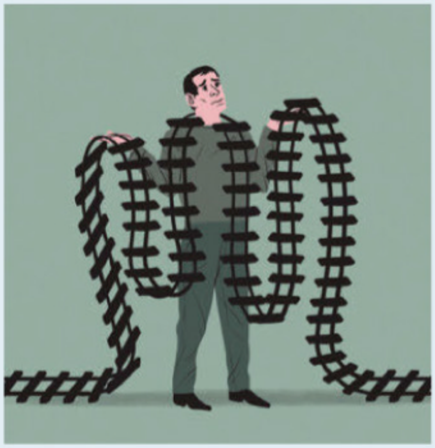
The embarrassment caused by Britain’s biggest construction project is set to last for many years yet. A plan to build a high-speed railway, called HS2, down the spine of England was approved by the government in 2012. This month came confirmation of another in a long series of delays. Now the first passengers will only get on board some time in the 2030s, if they are lucky. Costs have doubled from their initial estimate; bits of the route have been lopped off; and the trains will not zip along as quickly as originally planned.

Megaprojects like HS2 are the subject of an entertaining new book called “How Big Things Get Done” by Bent Flyvbjerg, an academic at Oxford University who specialises in such things, and Dan Gardner, a journalist. Mr Flyvbjerg is the compiler of a database of over 16,000 projects, which tells a grimly consistent tale of missed deadlines and shattered budgets. By his reckoning, only 8.5% of projects meet their initial estimates on cost and time, and a piddling 0.5% achieve what they set out to do on cost, time and benefits.

Mr Flyvbjerg’s advice is not a guarantee of success: his team was involved in assessing the risks associated with HS2. But the picture that he and Mr Gardner draw of why projects, large and small, tend to go wrong is compelling.

Over-optimistic time and cost estimates stem from both psychological and political biases: a reliance on intuition rather than data, and a problem that Mr Flyvbjerg and Mr Gardner call “strategic misrepresentation”. This is when budgets are deliberately lowballed in order to get things going, on the premise that nothing would ever get built if politicians went around being accurate. The sunk-cost fallacy, whereby people hesitate to halt projects because money spent will seem to have been wasted, means that the plug is seldom pulled once work is under way.

Planning is too often done in haste. The authors laud Pixar’s methodical approach to developing and testing films in great detail before they go into production. They also tell the story of how Frank Gehry’s meticulous architectural models helped ensure the success of the Guggenheim Museum in Bilbao. By keeping to a minimum the window when the project is actually being implemented, thorough planning reduces the probability of unexpected events derailing things. The people running HS2 seem to disagree. In theory the most recent delays enable the British government to spend less money each year; in practice they just increase the risk of yet more things going wrong.



Big bespoke projects are particularly likely to run into trouble. The more that a project can be disaggregated into replicable processes, the better its prospects. Mr Flyvbjerg’s database shows that solar-power and windpower installations stand the best chance of not going wrong, in part because standard components can be snapped together into arrays and turbines. At the other end of the risk scale lie gigantic one-off efforts like nuclear-power stations and the Olympic games.

Mitigating the dangers inherent in big bespoke projects is possible. Some think the future of nuclear energy lies in modular reactors. Paris, the city hosting next year’s summer Olympics, is using existing facilities for most of the sporting venues. Standardised designs and manufacturing processes for everything from train tracks to viaducts helped China build the world’s largest high-speed rail network in less than a decade at the start of this century.

Projects run into problems for specific reasons as well as general ones: Britain’s quagmire of planning rules is not something that China had to worry about, for instance. And the timescales, the scrutiny and the objectives of big public-infrastructure projects differ from those of corporate initiatives. But there are lessons here for managers of all stripes. If you plan rigorously and standardise where possible, you are less likely to dig yourself into a hole.

▸ Group embarked on a global charm offensive, set to conclude on March 17th in California. It appears to be working. Mr Jain, for one, has said GQG’s stakes in Adani businesses “most likely will increase depending on the price and how they deliver”. The group says it has been receiving plenty of interest from investors looking to park their money in its assorted companies. It says that a recent news report of a sale of just under 5% in its cement operations is bogus. But it does not dismiss the possibility of selling stakes in some of its divisions. Several of these, like the ports business, are solid operations offering predictable returns—maybe even good ones, if India’s economy continues to grow at its recent pace of 7-9% a year.

With the Adani Group on more stable footing, another question is bound to arise: how long can Mr Adani hold his nation-building ambitions in check? On March 1st his conglomerate was awarded a bauxite mine in a government auction. For the time being, the asset, for which the company had always been planning to bid, will be folded into Adani Enterprises’ mining subsidiary. But before the short-seller’s assault, the bid for the mine was widely regarded as part of a larger plan to enter aluminium smelting, steelmaking and other bits of heavy industry. Mr Adani is unlikely to have forsaken that idea for ever. ■

Internship We invite promising journalists and would-be journalists to apply for an internship supported by the Marjorie Deane Foundation. Successful candidates will spend three to six months with *The Economist* in London writing about business. Applicants are asked to send a covering letter and an original article of about 500 words that would be suitable for publication in the Business section. Applications should be sent to deaneintern@economist.com by April 1st.

Schumpeter | Napster, remixed

A battle royal is brewing over copyright and AI

Consider two approaches in the music industry to artificial intelligence (AI). One is that of Giles Martin, son of Sir George Martin, producer of the Beatles. Last year, in order to remix the Fab Four's 1966 album "Revolver", he used AI to learn the sound of each band member's instruments (eg, John Lennon's guitar) from a mono master tape so that he could separate them and reverse engineer them into stereo. The result is glorious. The other approach is not bad either. It is the response of Nick Cave, a moody Australian singer-songwriter, when reviewing lyrics written in his style by ChatGPT, an AI tool developed by a startup called OpenAI. "This song sucks," he wrote. "Writing a good song is not mimicry, or replication, or pastiche, it is the opposite. It is an act of self-murder that destroys all one has strived to produce in the past."

Mr Cave is unlikely to be impressed by the latest version of the algorithm behind ChatGPT, dubbed GPT-4, which OpenAI unveiled on March 14th. Mr Martin may find it useful. Michael Nash, chief digital officer at Universal Music Group, the world's biggest label, cites their examples as evidence of both excitement and fear about the AI behind content-creating apps like ChatGPT (for text) or Stable Diffusion (for images). It could help the creative process. It could also destroy or usurp it. Yet for recorded music at large, the coming of the bots brings to mind a seismic event in its history: the rapid rise and fall of Napster, a platform for sharing mainly pirated songs at the turn of the millennium. Napster was ultimately brought down by copyright law. For aggressive bot providers accused of riding roughshod over intellectual property (IP), Mr Nash has a simple message that sounds, from a music-industry veteran of the Napster era, like a threat. "Don't deploy in the market and beg for forgiveness. That's the Napster approach."

The main issue here is not AI-made parodies of Mr Cave or faux-Shakespearean sonnets. It is the oceans of copyrighted data the bots have siphoned up while being trained to create human-like content. That information comes from everywhere: social-media feeds, internet searches, digital libraries, television, radio, banks of statistics and so on. Often, it is alleged, AI models plunder the databases without permission. Those responsible for the source material complain that their work is hoovered up without consent, credit or compensation. In short, some AI platforms may be doing with other media what Napster did with songs—ignoring copyright altogether. The lawsuits have started to fly.

It is a legal minefield with implications that extend beyond the creative industries to any business where machine-learning plays a role, such as self-driving cars, medical diagnostics, factory robotics and insurance-risk management. The European Union, true to bureaucratic form, has a directive on copyright that refers to data-mining (written before the recent bot boom). Experts say America lacks case history specific to generative AI. Instead, it has competing theories about whether or not data-mining without licences is permissible under the "fair use" doctrine. Napster also tried to deploy "fair use" as a defence in America—and failed. That is not to say that the outcome will be the same this time.

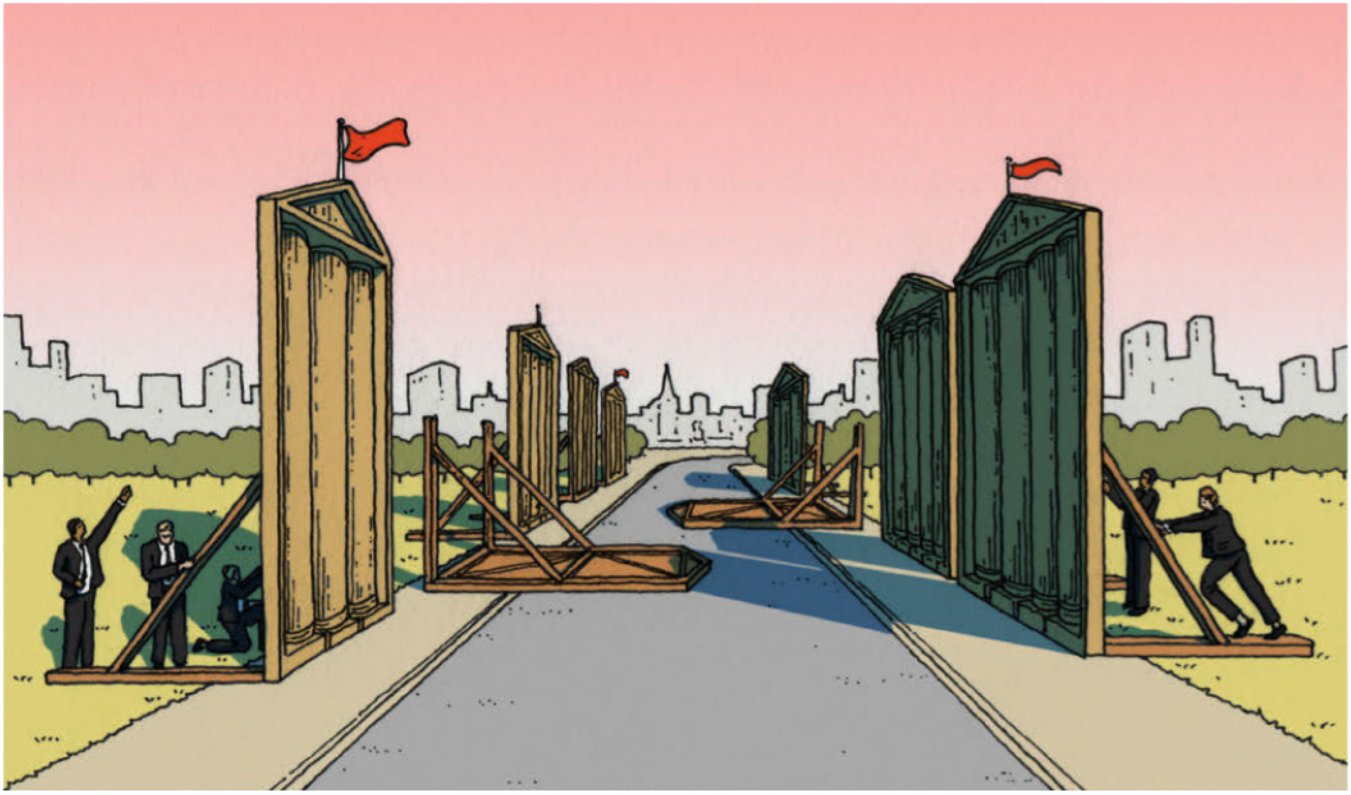
The main arguments around "fair use" are fascinating. To borrow from a masterclass on the topic by Mark Lemley and Bryan Casey in the *Texas Law Review*, a journal, use of copyrighted works is considered fair when it serves a valuable social purpose, the source material is transformed from the original and it does not affect the copyright owners' core market. Critics argue that AIs do not transform but exploit the entirety of the databases they mine. They claim that the firms behind machine learning abuse fair use to "free-ride" on the work of individuals. And they contend that this threatens the livelihoods of the creators, as well as society at large if the AI promotes mass surveillance and the spread of misinformation. The authors weigh these arguments against the fact that the more access to training sets there is, the better AI will be, and that without such access there may be no AI at all. In other words, the industry might die in its infancy. They describe it as one of the most important legal questions of the century: "Will copyright law allow robots to learn?"

An early lawsuit attracting attention is from Getty Images. The photography agency accuses Stability AI, which owns Stable Diffusion, of infringing its copyright on millions of photos from its collection in order to build an image-generating AI model that will compete with Getty. Provided the case is not settled out of court, it could set a precedent on fair use. An even more important verdict could come soon from America's Supreme Court in a case involving the transformation of copyrighted images of Prince, a pop idol, by the late Andy Warhol, an artist. Daniel Gervais, an IP expert at Vanderbilt Law School in Nashville, believes the justices may provide long-awaited guidance on fair use in general.

Scraping copyrighted data is not the only legal issue generative AI faces. In many jurisdictions copyright applies only to work created by humans, hence the extent to which bots can claim IP protection for the stuff they generate is another grey area. Outside the courtrooms the biggest questions will be political, including whether or not generative AI should enjoy the same liability protections for the content it displays as social-media platforms do, and to what extent it jeopardises data privacy.

The copyrighting is on the wall

Yet the IP battle will be a big one. Mr Nash says creative industries should swiftly take a stand to ensure artists' output is licensed and used ethically in training AI models. He urges AI firms to "document and disclose" their sources. But, he acknowledges, it is a delicate balance. Creative types do not want to sound like enemies of progress. Many may benefit from AI in their work. The lesson from Napster's "reality therapy", as Mr Nash calls it, is that it is better to engage with new technologies than hope they go away. Maybe this time it won't take 15 years of crumbling revenues to learn it. ■



After SVB's collapse

The prop-up job

WASHINGTON, DC

How deep is the rot in America's banking industry?

BANKING IS A confidence trick. Financial history is littered with runs, for the straightforward reason that no bank can survive if enough depositors want to be repaid at the same time. The trick, therefore, is to ensure that customers never have cause to whisk away their cash. It is one that bosses at Silicon Valley Bank (SVB), formerly America's 16th-largest lender, failed to perform at a crucial moment.

The fall of SVB, a 40-year-old bank set up to cater to the Bay Area tech scene, took less than 40 hours. On March 8th the lender said it would issue more than $2bn of equity capital, in part to cover bond losses. This prompted scrutiny of its balance-sheet, which revealed around half its assets were long-dated bonds, and many were underwater. In response, deposits worth $42bn were withdrawn, a quarter of the bank's total. At noon on March 10th regulators declared that SVB had failed.

It might have been a one-off. SVB's business—banking for techies—was unusual. Most clients were firms, holding in excess of the $250,000 protected by the Federal Deposit Insurance Corporation (FDIC), a regulator. If the bank failed they faced losses. And SVB used deposits to buy long-dated bonds at the peak of the market. "One might have supposed that Silicon Valley Bank would be a good candidate for failure without contagion," says Larry Summers, a former treasury secretary. Nevertheless, withdrawal requests at other regional banks in the following days showed "there was in fact substantial contagion".

Hence the authorities' intervention. Before markets reopened on March 13th, the Federal Reserve and the Treasury Department revealed that Signature Bank, a lender based in New York, had also failed. They announced two measures to guard against more collapses. First, all depositors in SVB and Signature would be made whole, and straightaway. Second, the Federal Reserve would create a new emergency-lending facility, the Bank Term Funding Programme. This would allow banks to deposit high-quality assets, like Treasuries or mortgage bonds backed by government agencies, in return for a cash advance worth the face value of the asset, rather than its market value. Banks that had loaded up on bonds which had fallen in price would thus be protected from SVB's fate.

These events raise profound questions about America's banking system. Post-financial-crisis regulations were supposed to have stuffed banks with capital, pumped up their cash buffers and limited the risks they were able to take. The Fed was meant to have the tools it needed to ensure that solvent institutions remained in business. Critically, it is a lender of last resort, able to swap cash for good collateral at a penalty rate in its "discount window". Acting as a lender of last resort is one of any central bank's most important functions. As Walter Bagehot, a former editor of *The Economist*, wrote 150 years ago in "Lombard Street", a central bank's job is "to lend in a panic on every kind of current security, or every sort on which money is ordinarily and usually lent." That "may not save the bank; but if it do not, nothing will save it." ▸▸

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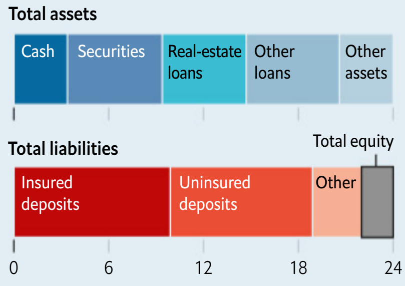
The Fed and Treasury's interventions were the sort which would be expected in a crisis. They have fundamentally reshaped America's financial architecture. Yet at first glance the problem appeared to be poor risk management at a single bank. "Either this was an indefensible overreaction, or there is much more rot in the American banking system than those of us on the outside of confidential supervisory information can even know," says Peter Conti-Brown, a financial historian at the University of Pennsylvania. So which is it?

To assess the possibilities, it is important to understand how changes in interest rates affect financial institutions. A bank's balance-sheet is the mirror image of its customers'. It owes depositors money. Loans people owe it are its assets. At the beginning of 2022, when rates were near zero, American banks held $24trn in assets. About $3.4trn of this was cash on hand to repay depositors. Some $6trn was in securities, mostly Treasuries or mortgage-backed bonds. A further $11.2trn was in loans. America's banks funded these assets with a vast deposit base, worth $19trn, of which roughly half was insured by the FDIC and half was not. To protect against losses on their assets, banks held $2trn of "tier-one equity", of the highest quality.

Then interest rates leapt to 4.5%. SVB's fall has drawn attention to the fact that the value of banks' portfolios has fallen as a result of the rise in rates, and that this hit has not been marked on balance-sheets. The FDIC reports that, in total, America's financial institutions have $620bn in unrealised mark-to-market losses. It is possible, as many have done, to compare these losses with the equity banks hold and to feel a sense of panic. In aggregate a 10% hit to bond portfolios would, if realised, wipe out more than a quarter of banks' equity. The financial system might have been well-capitalised a year ago, so the argument goes, but a chunk of this capitalisation has been taken out by higher rates.

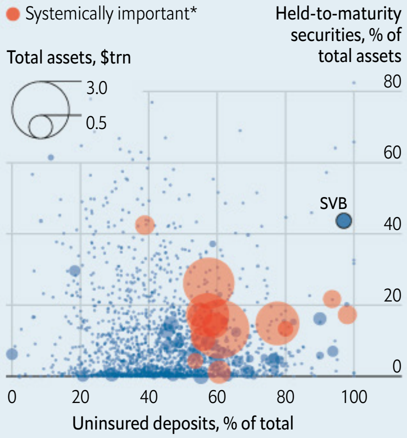
The exercise becomes more alarming still when other assets are adjusted for higher rates, as Erica Jiang of the University of Southern California and co-authors have done. There is, for instance, no real economic difference between a ten-year bond with a 2% coupon and a ten-year loan with a fixed 2% interest rate. If the value of the bond has fallen by 15% so has the value of the loan. Some assets will be floating-rate loans, where the rate rises with market rates. Helpfully, the data the researchers compiled divides loans into those with fixed and floating rates. This allows the authors to analyse only fixed-rate loans. The result? Bank assets would be worth $2trn less than reported—enough to wipe out all equity in the American banking system. Although some of this risk could be hedged, doing so is expensive and banks are unlikely to have done much of it.



Between the balance-sheets

US banks, aggregate balance-sheet, Q1 2022, $trn

Source: "Monetary tightening and US bank fragility in 2023: mark-to-market losses and uninsured depositor runs?", by E.X. Jiang, G. Matvos, T. Piskorski, A. Seru, March 2023



Flight risk v turbulence

US banks, at December 31st 2022

*More than $250bn in assets

Source: Federal Financial Institutions Examination Council

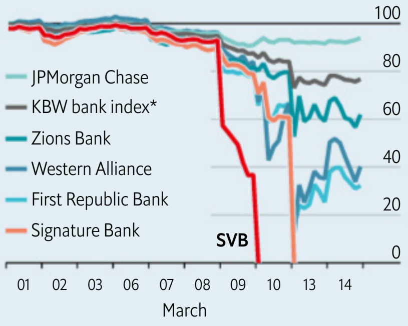
But as Ms Jiang and co-authors point out, there is a problem with stopping the analysis here: the value of the counterbalancing deposit base has not also been re-evaluated. And it is much, much more valuable than it was a year ago. Financial institutions typically pay nothing at all on deposits. These are also pretty sticky, as depositors park money in checking accounts for years on end. Meanwhile, thanks to rising rates, the price of a ten-year zero-coupon bond has fallen by almost 20% since early 2022. This implies the value of being able to borrow at 0% for ten years, which is what a sticky, low-cost deposit base in effect provides, is worth 20% more now than it was last year—more than enough to offset losses on bank assets.

The true risk to a bank therefore depends on both deposits and depositor behaviour. When rates go up customers may move their cash into money-market or high-yield savings accounts. This increases the cost of bank funding, although typically not by all that much. Sometimes—if a bank runs into severe difficulties—deposits can vanish overnight, as SVB discovered in ruinous fashion. Banks with big, sticky, low-cost deposits do not need to worry much about the mark-to-market value of their assets. In contrast, banks with flighty deposits very much do. As Huw van Steenis of Oliver Wyman, a consultancy, notes: "Paper losses only become real losses when crystallised."

How many banks have loaded up on securities, or made lots of fixed-rate loans, and are uncomfortably exposed to flighty deposits? Insured deposits are the stickiest because they are protected if things go wrong. So Ms Jiang and co-authors looked at uninsured cash. They found that if half of such deposits were to be withdrawn, the remaining assets and equity of 190 American banks would not be enough to cover the rest of their deposits. These banks currently hold $300bn in insured deposits.

The newfound ability to swap assets at face value, under the Bank Term Funding Programme, at least makes it easier for banks to pay out depositors. But even this is only a temporary solution. For the Fed's new facility is something of a confidence trick itself. The programme will prop up struggling banks only so long as depositors think it will. Borrowing through the facility is done at market rates of around 4.5%. This means that if the interest income a bank earns on its assets is below that—and its low-cost deposits leave—the institution will simply die a slow death from quarterly net-interest income losses, rather than a quick one brought about by a bank run.

This is why Larry Fink, boss of BlackRock, a big asset-management firm, has warned of a "slow-rolling crisis". He expects this to involve "more seizures and shutdowns". That high interest rates have exposed the kind of asset-liability mismatch that felled SVB is, he reckons, a "price we're paying for decades of easy money". Mr Conti-Brown of UPenn points out that there are historical parallels, the most obvious being the bank casualties that mounted in the 1980s as Paul Volcker, the Fed's chairman at the time, raised rates. ▸▸



Run race

Share prices, February 28th 2023=100

Source: Bloomberg

*24 US banks

Higher rates have exposed problems in bond portfolios first, as markets show in real-time how these assets fall in value when rates rise. But bonds are not the only assets that carry risk when policy changes. "The difference between interest-rate risk and credit risk can be quite subtle," notes Mr Conti-Brown, as rising rates will eventually put pressure on borrowers, too. In the 1980s the first banks to fail were those where asset values fell with rising rates—but the crisis also exposed bad assets within America's "thrifts", specialist consumer banks, in the end. Thus pessimists worry banks now failing because of higher rates are just the first domino to collapse.

The result of all this is that the banking system is far more fragile than it was perceived to be—by regulators, investors and probably bankers themselves—before the past week. It is clear that smaller banks with uninsured deposits will need to raise more capital soon. Torsten Slok of Apollo, a private-equity firm, points out that a third of assets in America's banking system are held by banks smaller than SVB. All of these will now tighten up lending to try to strengthen their balance-sheets.

That medium-sized banks can be too big to fail is one lesson regulators should learn from SVB. The episode has upended other parables of post-crisis finance as well. "After 2008 investors thought deposits were safe, and market funding was risky. They also thought Treasuries were safe and loans were risky," says Angel Ubide of Citadel, a hedge fund. "All of the post-crisis rule books were written on that basis. Now the reverse looks to be the case." One parable remains intact, however. Problems in the financial system never emerge from the most closely watched places. ■

Buttonwood Fed bound

Silicon Valley Bank's demise signals a painful new phase in financial markets

To quell inflation, goes the adage, central bankers must tighten monetary policy until something breaks. For much of the past year this cliché has been easy to dismiss. Starting in March 2022, America's Federal Reserve has raised rates at the fastest clip since the 1980s. Even as markets plunged, the world's financial system stayed wreckage-free. When British pension funds wobbled in September, the Bank of England swiftly helped right them. The most notable collapse—that of FTX, a disgraced former crypto exchange—was well outside the mainstream and, regulators say, caused by fraud rather than the Fed.

Now something has broken. The failure of Silicon Valley Bank (SVB), a mid-tier American lender that went bust on March 10th, sent shock waves through markets. Most noticeable were convulsions in the stocks of other banks, which investors worried may have similar vulnerabilities. Nasdaq's index of bank stocks dropped by a quarter in the course of a week, erasing gains from the preceding 25 years. Shares in American regional lenders were bludgeoned much harder. Then the turmoil went global: shares in Credit Suisse, a European bank, cratered on March 15th. Financial markets have entered a new phase, in which the Fed's tightening cycle starts to bite.

One feature of this phase is that markets are suddenly working with the Fed rather than against it. For more than a year, the central bank's officials have been repeating the same message: that inflation is proving more stubborn than expected, meaning interest rates will need to rise higher than previously predicted. This message was reinforced by data released on March 14th showing that underlying consumer prices had once again risen faster than expected.

Policymakers want to tighten financial conditions—such as lending standards, interest costs or money-market liquidity—in order to reduce aggregate demand and cool price rises. Since October, markets have been pulling in the other direction. A gauge of financial conditions compiled by Bloomberg, a data provider, has shown them steadily loosening. Over the past week, all this loosening has been reversed. SVB's collapse has shocked markets into doing the Fed's job.

That does not mean investors have given up fighting the Fed. They are still betting it will soon start cutting rates, even though officials have given no such indication. The battleground has nevertheless shifted. Earlier this year, expectations of rate cuts sprang from hopes inflation would fall faster than the Fed expected. Now they reflect fear. On March 13th the two-year Treasury yield fell by 0.61 percentage points, the biggest one-day drop in more than 40 years. Panicked trading on March 15th prompted worries of the market seizing up. Given that some banks have failed, investors are betting that the Fed will cut rates not because the inflation monster is tamed, but in order to avoid breaking anything else.

Taken in conjunction with the reaction in other markets, this suggests a degree of cognitive dissonance. Broader stockmarket indices fell, but not precipitously. The S&P 500 index of large American firms is level with its position at the start of the year. The dollar, which tends to strengthen in crises as investors flock to safety, weakened a little. On the one hand, investors think the Fed should fear bank failures enough to start cutting rates. On the other, they do not themselves fear the fallout of such a failure enough to reflect it in prices.

Lying behind this contradiction is supposed tension between the Fed's inflation target and its duty to protect financial stability. The failure of SVB, which was rooted in losses from fixed-rate bonds (the value of which fell as rates rose), looks like evidence for this. Since even the fight against inflation pales in importance next to the stability of the banking system, goes the argument, the Fed cannot afford to raise rates any higher. This lowers the risk of recession, gives a boost to stocks and reduces the need for haven assets like the dollar.

Do not be so sure. Following SVB's collapse, the Fed has promised to backstop other banks. Its support—lending against securities worth as little as two-thirds of the loan value—should prevent any remotely solvent institution from going under wherever interest rates end up. Alongside this generosity lies an uncomfortable truth. To squeeze inflation out of the economy, the Fed needs to make lenders nervous, loans expensive and businesses risk-averse. Allowing reckless banks such as SVB to fail is not a tragic accident. It is part of the Fed's job.

Hunting for risk

Duration danger

SINGAPORE

The search for portfolios like Silicon Valley Bank's leads investors to Japan

The demise of Silicon Valley Bank had many causes. But at its heart was the institution's bond portfolio, which plummeted in value as interest rates rose. Little surprise, then, that analysts and investors are scrambling to locate similar hoards elsewhere. One disconcerting finding lies in Japan. Investment institutions there have accumulated vast stocks of domestic and foreign long-maturity bonds.

These bond holdings have already slumped in value, thanks to a combination of sales and the revaluation that occurs when rates rise—the potential for which is known as "duration risk". Long-term foreign-bond holdings by "other financial corporations", a category which includes insurance firms, investment outfits and pension funds, ran to $1.5trn in June, the most recent figure available, some $293bn below their level at the end of 2021.

Norinchukin Bank, a Japanese investment firm, is one holder of such bonds. The company has been a mammoth buyer of collateralised-loan obligations, bundles of loans secured in a single product. The value of its bond portfolio has been clipped by rising rates, from ¥36trn ($293bn) in March last year to ¥28trn in December. Japan Post Bank, a savings bank, of which the Japanese government owns almost a third, is another exposed institution. Foreign securities have risen from essentially zero in 2007 to 35% of the firm's total holdings.

These institutions' customers are likely to prove less flighty than SVB's. In Silicon Valley the run was led by panicked venture capitalists. Japan Post Bank has an army of individual depositors across the country, boasting around 120m accounts. Norinchukin Bank's clients, which are mostly agricultural co-operatives, also seem less likely to flee than excitable tech types.

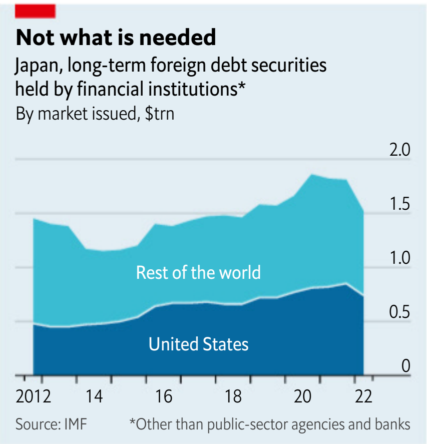
But there is a risk from currency movements. As Brad Setser of the Council on Foreign Relations, a think-tank, has noted, the rise in American interest rates has made hedging against currency risk far more expensive. This is true for both investors and the companies and governments from which they once bought bonds. Japanese investors sold $165bn more in foreign long-term bonds than they bought last year, the largest disposal on record. Rising rates have left bond issuers across huge swathes of the world paying more to borrow. The disappearance of previously reliable buyers only adds to the pain.

And enormous holdings of foreign financial assets are just one element of the risk. Japanese interest rates have been at rock-bottom levels by global standards since the early 1990s, after the country's infamous land and stock bubble burst. Three decades of relative economic stagnation and occasional deflation have meant very low bond yields, which have driven financial institutions to long-term yen-denominated bonds for modestly higher returns. This increases the amount of damage even slightly tighter monetary policy might do.

But it is increasingly unclear whether Japan will actually be able to maintain its low-rate approach. Consumer-price inflation rose to 4.3% in January; wages at large firms look set to rise at their fastest pace in decades. A one-percentage-point rate rise would knock more than ¥9trn off the value of banks' yen-denominated bonds. Unrealised losses at big banks would be equivalent to around 10% of their capital. Those at *shinkin* banks, types of credit union, would be higher still at around 30%.

Last year the Bank of Japan (BOJ) published analysis suggesting these losses would be offset by the changing value of liabilities. The interest rates banks offer to depositors tend to rise far more slowly than those they charge on new loans, relieving pressure. For regional banks, the analysis suggested, the two forces would almost entirely offset one another. But the central bank's calculations depend on assumptions about the loyalty of depositors. The slump in the value of banks' portfolios from higher rates is certain; the stickiness of depositors has not been tested recently.

The BOJ insists there is still no prospect of rate rises. But recent inflationary pressure and rises in the rest of the world mean this line is getting harder to hold. The mere possibility of an increase is already having an impact on foreign-bond holdings, as investors dispose of assets. And as Japanese institutions shift from buyers to sellers, global corporate and government bond-issuers are losing once-reliable customers, just when they require them most. ■



Not what is needed

Japan, long-term foreign debt securities held by financial institutions*

By market issued, $trn

Source: IMF *Other than public-sector agencies and banks

Investment post-SVB

The stages of grief

SAN FRANCISCO

Venture capitalists mourn their banker

Silicon Valley is a tough place to be a banker. Startup bosses call with references but no revenue. Loans can seldom be secured against physical assets. Many clients fail. Silicon Valley Bank (SVB) netted nearly half of America's venture-backed technology and life-science firms as clients by providing what a venture capitalist calls the "the white-glove, red-carpet treatment". This was not just about the lunches and events it put on for clients: SVB established itself as a reliable cog in Silicon Valley's dream machine. In the *Financial Times*, Michael Moritz of Sequoia Capital, a grand venture-capital outfit, lamented the loss as akin to a "death in the family".

Thanks to regulators, SVB's demise has not meant a Silicon Valley cash crunch. Tech workers need only worry about their jobs as much as they did before. For some, relief at a bullet dodged has turned into anger at the companies quickest to pull deposits, which helped bring down their beloved bank. The next stage of grief ought to be sober risk management. According to the venture capitalist, the chance to replace SVB as banker to Silicon Valley is a "tremendous opportunity". There will be no shortage of institutions with eyes on the $300bn of venture-capital dry powder waiting to be ploughed into startups. But SVB's collapse will scale back Silicon Valley's ambitions in other ways.

Exactly where the dust and deposits settle remains uncertain. Reports suggest regulators are attempting another auction of SVB, having been unable to find a buyer last weekend. Banks and private-equity funds are circling. Nonetheless, startups are finding new homes for their cash. In the chaos of last week, companies with accounts elsewhere transferred their funds. Others tripped on red tape as they frantically opened new ones. Some even wired money to personal accounts. Fintechs had a busy weekend, too. Brex, one such firm, opened 3,000 new accounts. Yet relationships between fintechs and regional banks, which have suffered in the wake of SVB's collapse, may scare off potential long-term clients.

The big banks are likely to be the main custodians of Silicon Valley's cash in future. Bank of America, Citigroup and JPMorgan Chase can scarcely open accounts quickly enough. Once there, startups can expect a safer, if considerably less intimate, service. Call it the grey-carpet

▸▸

Death Valley

treatment. On March 13th SVB's British operations were acquired for £1 ($1.21) by HSBC, a multinational behemoth. The new business will account for less than 1% of loans, deposits and profits at the firm. Whether the largest institutions reassess the way they bank the smallest tech firms remains to be seen, but such firms will never be their core concern.

Another question is what will happen to the venture-debt market. SVB was a major player, with $6.7bn of such loans outstanding when it went under. Startups used this low-cost lending to top up balance-sheets between equity funding rounds. Most now expect such loans to become more expensive, especially for the youngest firms. Venture-capital outfits are unlikely to lower themselves en masse to the comparatively small returns offered by this variety of lending. Other wheels on the venture-capital machine will need oiling, too. For example, SVB often provided bridge financing to venture-capital firms, which enabled them to strike deals while awaiting cash from investors.

The loss of SVB is likely to have a chilling effect on an industry already suffering from higher interest rates. Limits on financing and difficulties banking small firms will make venture capital's adjustment to this new world harder than it otherwise would have been. Bankers may have to wait to see venture capital's dry powder hit their deposit accounts—after all, in the last quarter, the amount of money flowing into startups globally fell by two-thirds. But sooner or later the expectations of investors and startups will realign, and firms will face dreaded "down-rounds" at lower valuations. Trips to the bank might then remind dealmakers of their own mortality. After years of exuberance, that is not necessarily a bad thing. ■

Europe's problem

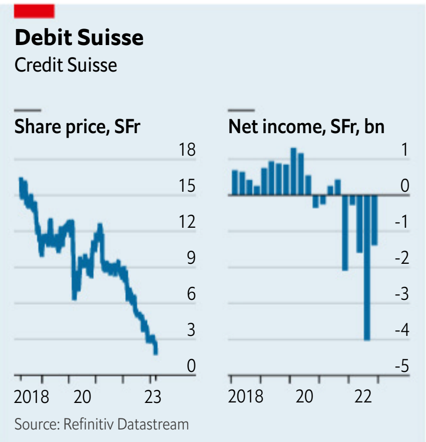
Paradeplatz panic

As fear sweeps the market, Credit Suisse faces share-price turbulence

SHAKY SHARE-ISSUANCES can sink banks. The disastrous attempt by Silicon Valley Bank (SVB) to raise capital proved as much. On March 15th Credit Suisse found that shaky shareholders can do lots of damage, too. Saudi National Bank, the firm's biggest shareholder, appears to be suffering a bad case of buyer's remorse. Quizzed about any further investment in Credit Suisse, the response from the Saudi bank's chairman was brutal: "Absolutely not, for many reasons outside the simplest reason, which is regulatory and statutory."

Investors ran for cover. Credit Suisse's share price plunged by a quarter to its lowest-ever level; other European banks took a knock as well. Reports swirled that financial institutions were examining their exposure to the bank. By the end of the day Swiss regulators had released a statement saying that Credit Suisse met the capital and liquidity requirements applicable to big banks, but that they would offer the bank support if needed. In the early hours of March 16th, Credit Suisse said it would borrow up to SFr50bn ($54bn) from the central bank and buy back debt. This prompted some recovery in its share price.

Investors are unlikely to lose their shirts. Yet they have plenty of reason to grumble. Multibillion-dollar losses from Credit Suisse's dealings with Archegos Capital, a family office that collapsed in 2021, and Greensill Capital, a supply-chain-finance firm that also imploded that year, are near the top of the list. Last year clients withdrew cash from every corner of the bank. It was all too much for one long-term shareholder: Harris Associates, an investment firm, sold the last of its shares.



Debit Suisse

Credit Suisse

Source: Refinitiv Datastream

Newer owners have experienced their share of woes. On March 9th Credit Suisse announced a delay in the publication of its annual report owing to a last-minute call from the Securities and Exchange Commission, America's main financial regulator. The accounting issues in question are nothing major, but the firm's confession of "material weaknesses" in its financial-reporting system is hardly likely to have reassured investors.

When shareholders finally got their hands on the report on March 14th, it made for grim reading. At the end of 2022 Credit Suisse posted its fifth consecutive quarterly loss. Raising SFr4bn late last year repaired the bank's common equity to risk-weighted assets ratio, a crucial indicator of a bank's capital strength. The figure now stands at a respectable 14.1%, up from 12.6% at the end of September. But few expect it to hold steady as the bank embarks on an ambitious restructuring programme and simultaneously attempts to reverse uncomfortable outflows of client cash.

Plugging this cash gush is the immediate problem. Assets managed by the wealth-management division fell from SFr740bn at the end of 2021 to just over SFr540bn in 2022, as bankers failed to convince ultra-rich clients to park their money with Credit Suisse. Little reprieve was found in the domestic Swiss bank, normally the cash cow of the business. Total outflows amounted to 8% of assets under management in the fourth quarter, obliging the bank to use its liquidity buffers.

Although Ulrich Körner, Credit Suisse's chief executive, hopes to trim the cost base and restructure its investment bank, more pain could lie ahead. The remodelled investment bank, called CS First Boston, will revolve around Michael Klein, a dealmaking supremo. He had served on Credit Suisse's board of directors until October 2022. In February the bank bought his boutique advisory shop for $175m.

There are reasons to take the intention to build a big boutique investment bank seriously. Credit Suisse has long excelled in advising on corporate buy-outs, which will eventually recover after a frosty 2022. Giving senior managers equity in the business is a reasonable way to attract dealmakers. But those preparing for the leap will this week probably have decided to pause in order to assess the damage.

In the event of a catastrophic run, which now seems unlikely, few doubt the Swiss state would come to the rescue of half of the country's beloved banking duopoly. One option is a tie-up with Credit Suisse's better-behaved compatriot, UBS. Such a rescue mission would have a weak commercial logic, however, and involve considerable turbulence. As with Credit Suisse's current plans, its success would be far from guaranteed. ■

Economic growth

Fun while it lasted

SAN FRANCISCO

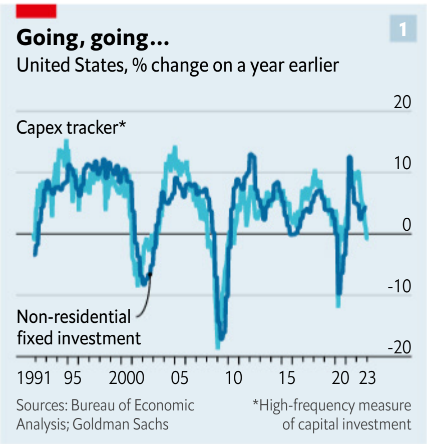
The global capex boom appears to have fizzled out

ALMOST WHEREVER you look, companies seem to be scaling back their ambitions. Meta, the owner of Facebook, recently said that it would invest less in 2023 than previously promised. Disney is slimming its capex plans for this year by a tenth, meaning punier investment in its theme parks. Calavo Growers, a huge producer of avocados and other fruit, intends to reduce its capital expenditures "while we navigate near-term uncertainties".

The anecdotes are part of an unfortunate broader trend. A global survey of purchasing managers tracks new orders of investment goods, a proxy for capital spending. After surging in 2021, it now points to demand in line with the 2018-19 average. An American capex "tracker" produced by Goldman Sachs, a bank, offers a picture of businesses' outlays, as well as hinting at future intentions. It is currently registering close to zero growth, year on year (see chart 1). A global tracker produced by JPMorgan Chase, another bank, also points to a sharp deceleration. *The Economist* analysed capital-spending data from 33 OECD countries. In the fourth quarter of last year capex fell by 1% from the previous quarter.

Investment is the most volatile component of GDP. When it soars, the economy as a whole tends to do the same. Extra capex and R&D boosts productivity, raising incomes and living standards. There were hopes the covid-19 pandemic would mark the start of a new "capex supercycle". In response to the crisis, firms ramped up spending on everything: digitisation, supply chains and more. Rich-world fixed investment took just 18 months to regain its pre-pandemic peak, a fraction of the time it took after the global financial crisis of 2007-09. In 2021 and 2022 firms in the S&P 500 index of large American firms spent $2.5trn, equivalent to 5% of the country's GDP, on capex and R&D, a real-terms rise of around a fifth compared with 2018-19.

Check the screws



Going, going... 1

United States, % change on a year earlier

Sources: Bureau of Economic Analysis; Goldman Sachs

*High-frequency measure of capital investment

Thus the latest figures are sobering. What people thought was the start of a structural trend may in fact have been end-of-lockdown exuberance. Businesses are revising down future capex investment, too. Our analysis of the plans of around 700 big, listed American and European firms suggests real-terms spending will fall by 1% in 2023. Markets have caught on to this change. In Europe, for instance, the share prices of companies that usually do well when capital spending is high—such as semiconductor and chemicals companies—soared relative to the wider stockmarket in 2021, but have since fallen back.

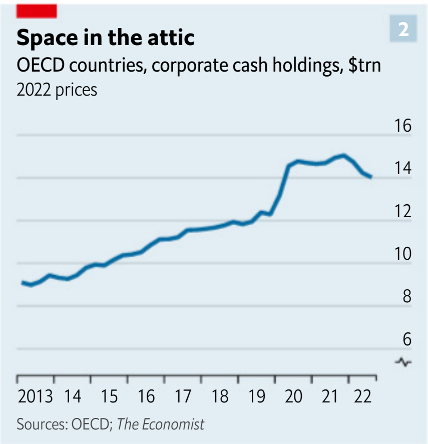
Why is the boom coming to an end? Three potential explanations are most convincing. The first is that companies have less cash to burn than even a few months ago. Firms across the rich world accumulated extraordinarily high cash balances during the pandemic, in part because of grants and loans from governments. According to our calculations, however, since the end of 2021 the piles have fallen by about $1trn in real terms (see chart 2).

The second relates to global economic conditions. Supply-chain snarl-ups are not as bad as in 2021, meaning there is less need to invest in extra capacity or stock up on inventory. Figures from PitchBook, a data provider, suggest that in the fourth quarter of 2022 the number of venture-capital deals in supply-chain tech fell by about half compared with the year before. Inflation has eaten into consumers' real incomes—and businesses are less likely to invest in new products and services if they worry that no one will buy them. Meanwhile, survey data suggest that higher interest rates are also prompting cuts.

The third factor may be the most significant. The capex boom was based in large part on the assumption that pandemic lifestyles would last forever, prompting economic reallocation that would require an ever-larger number of new technologies. In many ways, however, the post-pandemic economy looks remarkably similar to the pre-pandemic one. It turns out there is a limit to people's Netflix consumption and Peloton use. Spending on services has nearly caught up with spending on goods.

There are exceptions—not least oil companies—which are likely to boost capex this year, but these firms account for only a small share of overall spending. The companies that led the capex charge are retreating. Semiconductor firms, in particular, have realised that they massively over-invested in capacity, and are now pulling back. In the final quarter of 2022 American real spending on information-processing equipment was down by 2%, year on year. The big tech firms are likely to cut capex by 7% in real terms in 2023, forecasters think.

In America the Inflation Reduction Act will offer big incentives for green spending; the EU is unveiling its own subsidies. Russia's war in Ukraine is encouraging Europeans to invest in alternative sources of energy. And in an attempt to rely less on China and Taiwan, many firms are looking to break ground on factories elsewhere. In time, these various changes may cause investment to tick up once again. But there is no getting away from the fact that the capex boom has fizzled out. ■

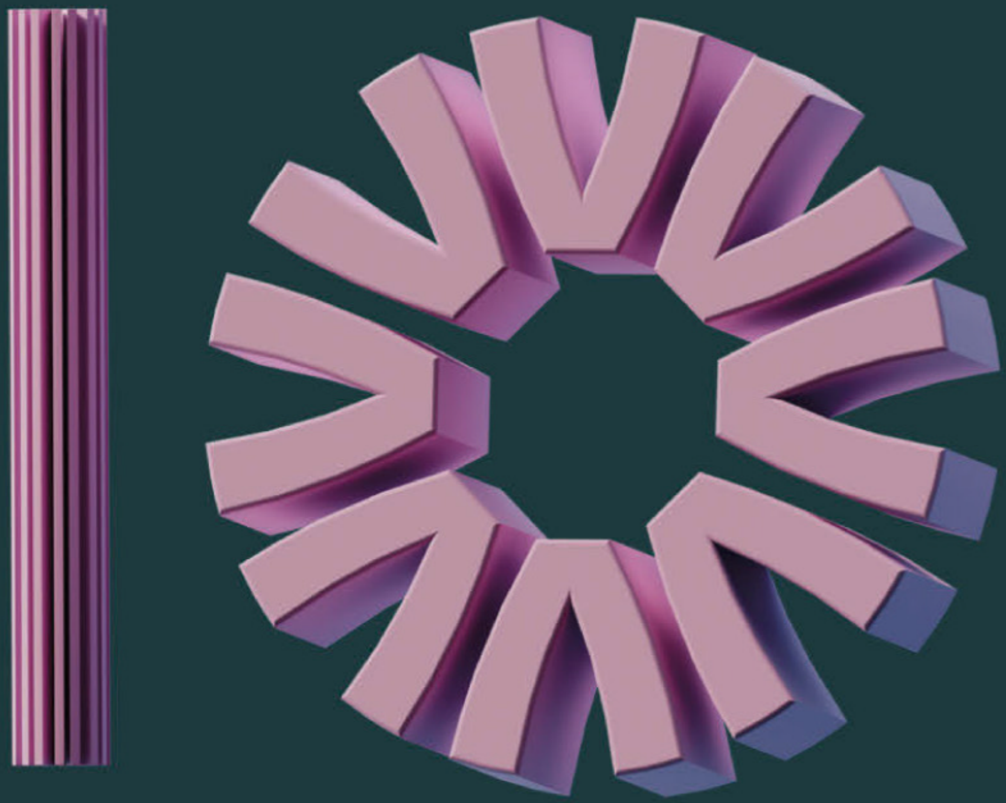


Space in the attic 2

OECD countries, corporate cash holdings, $trn

2022 prices

Sources: OECD; *The Economist*



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Free exchange | After the rescue

The Federal Reserve smothers capitalism in an attempt to save it

MUCH ABOUT the collapse of Silicon Valley Bank has been profoundly modern. The bank's name. A client base of tech-focused venture capitalists. A panic whipped up by tweets. Cash withdrawals via smartphones. At its crux, though, the lender's fall was the latest iteration of a classic bank run. And the solution, a central bank stepping in to backstop the financial system, was time-honoured, too. So well-trodden is the topic in economics that the lyrical phrase describing the central bank's actions, "lender of last resort", is often abridged to its ungainly acronym, LOLR.

A review of the history shows both the typical and the unique in the case of Silicon Valley Bank. There is ample, albeit imperfect, precedent for the Fed's actions. Yet they continue a worrying trend of ever-broader interventions and, consequently, distortions to the financial system. This gives rise to questions about whether, in the long run, the Fed's pursuit of stability harms the economy.

It would be remiss for a column in *The Economist* to overlook the person often credited with first articulating the theory of LOLR: Walter Bagehot, an editor of this newspaper in the 19th century. Over the years, his ideas evolved into a rule for how central banks should manage panics: lend quickly and freely, at a punitive rate, against good collateral. As Sir Paul Tucker, formerly of the Bank of England, has put it, the logic is twofold. Knowing the central bank stands behind commercial lenders, depositors have less incentive to flee. If a run does occur, intervention helps limit sell-offs.

Nearly as old as Bagehot's writing is the obvious objection to LOLR: that of moral hazard. Foreknowledge of central-bank intervention may induce bad behaviour. Banks will hold on to fewer liquid, low-yielding assets, piling instead into higher-risk lines of business. How to prevent panics without sowing new dangers is perhaps the central question faced by financial regulators.

The clearest evidence of the need for a financial backstop of some variety comes from the pre-LOLR years. There were eight American banking panics in the half-century between 1863 and 1913, each delivering heavy blows to the economy. The government responded by creating the Federal Reserve system in 1913. But broken into regional fiefdoms, it was too timid in response to the Great Depression. Only in the aftermath of that crisis did America establish a true LOLR framework. Power was concentrated at the Fed's centre, while the federal government introduced deposit insurance. To limit moral hazard, other tools such as deposit-rate caps constrained banks. This has remained the general LOLR template ever since: authorities both provide support and impose limits. Getting the balance right is what is fiendishly difficult.

In the decades after the Great Depression, the Fed seemed to have put an end to bank runs. But starting in the 1970s, when inflation soared and growth softened, the financial system came under stress. On each occasion officials expanded their playbook. In 1970 they snuffed out trouble that originated outside the banking system. In 1974 they auctioned off a failed bank. In 1984 they guaranteed uninsured deposits. In 1987 they pumped liquidity into the banking system after a stockmarket crash. In 1998 they helped to unwind a hedge fund. Even if each episode was different, the basic principles were consistent. The Fed was willing to let a few dominoes fall. Ultimately, though, it would stop the chain reaction.

These various episodes were dress rehearsals for the Fed's maximalist responses to the global financial crisis of 2007-09 and the covid crash of 2020. Both times it created a dizzying array of new credit facilities for struggling banks. It guided financing to troubled corners of the economy. It accepted an ever-wider array of securities, including corporate bonds, as collateral. It allowed big firms to fail—most significantly, Lehman Brothers. And as markets started to work again, it retracted much of its support.

Such extensive interventions prompted a rethink of moral hazard. In the 1970s the concern was over-regulation. Rather than making the financial system safer, policies such as the deposit-rate caps had pushed activity to shadow lenders. Little by little, regulators lightened restrictions. But after the financial crisis, the pendulum swung back towards regulation. Big banks now must hold more capital, limit their trading and undergo regular stress-testing. Heftier support from the Fed has come with stricter limits.

In this context, the government's response to Silicon Valley Bank looks more like another notch in the wall rather than a radical new design. It is hardly the first time that uninsured depositors have walked away scot-free from a financial calamity. Nor is it the first time that the Fed has let a couple of banks fail before introducing a credit programme that is likely to save similar firms.

Hazard lights

Yet every notch in the wall is also indicative of an increasingly expansive Fed. In one important respect, its assistance has been far more lavish than in previous rescues. When providing emergency credit, it is normally conservative in its collateral rules, using market prices to value the securities that banks hand over in exchange for cash. Moreover, it aims to lend only to solvent firms. This time, however, the Fed has accepted government bonds at face value, even though their market value has fallen sharply. That is remarkable. If it had to seize collateral, it could suffer a loss in present-value terms. And the programme could breathe life into banks that, in mark-to-market terms, were insolvent.

The Fed has no desire to make its latest changes permanent. It has capped its special loans at just one year—long enough, officials hope, to stave off a crisis. If they get their way, calm will eventually return, investors will shrug their shoulders and banks will get back to business without needing the Fed's support. But if they do not and more banks fail, the Fed will be left holding underwater assets on its books, absorbing financial damages that would have otherwise belonged to the market. The lender of last resort risks morphing into the loss-maker of first resort. ■

Science & technology

Sports injuries

Brainslammed

Evidence is growing that playing contact sports, such as rugby, can lead to long-term neurological problems

MEETING NELSON MANDELA should be a high point in anyone's life. But Alix Popham, a Welsh former rugby player who once met the legendary president of South Africa before a match, has no memory of the encounter. Later that day during the game, he was struck so hard on the head that he suffered a severe concussion, an injury in which his brain was thrown around inside his skull.

Concussions can cause someone to see stars or slur their speech. They might also be knocked unconscious, as in Mr Popham's case, and robbed of what may have become cherished memories. But Mr Popham (pictured above, in red and crashing into an opponent's arm) believes that the thousands of repeated knocks to his head over the course of his rugby career have robbed him of far more. He now gets lost easily, hates background noise and, in a fit of rage, once ripped off a banister upstairs in his home. He is 43 and has been diagnosed with early-onset dementia.

Mr Popham is not alone. Last year Rylands Garth, a British law firm, began court proceedings against World Rugby, rugby union's world governing body, and also the sport's national governing bodies in England and Wales, on behalf of 225 former professional players with neurological impairments. It is just one claim among several in Europe. Otherwise-healthy sportsmen in their 30s and 40s are suffering from a host of conditions that include motor-neurone disease, early-onset dementia, Parkinson's disease and chronic traumatic encephalopathy (CTE). There are concerns that these injuries were acquired through a professional career playing contact sports, and that sporting authorities did not take the right actions to prevent them.

The outcome of these legal claims, and also any changes to how contact sports may be played in future, rely on the emerging scientific evidence that aims to link historic blows to the head with the various neurological conditions currently afflicting the players. In America the National Football League (NFL) and the National Hockey League settled similar legal cases in 2013 and 2018 respectively.

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An early focus of concern was evidence that concussions were leading, in some players, to CTE. This degenerative brain disease causes memory loss, confusion and problems with impulse control, among a range of other symptoms. Worry about concussion, which is a mild form of traumatic brain injury (TBI), has since spread to sports including ice hockey, boxing and football.

The dam breaks open

TBIs are accepted as increasing the risk of developing dementia—in 2020, *The Lancet* commission on dementia, convened by academics to recommend ways to tackle the rise in neurodegenerative conditions, added TBIs to their list of causative factors. Moreover, there is compelling experimental work in mice that shows that blows to the head, even when they do not result in the classic signs of concussion, can nevertheless lead to brain injuries and the first steps towards CTE. In 2019 an ongoing study of almost 8,000 former professional footballers in Scotland reported that their rate of death from neurodegenerative diseases was three-and-a-half times higher

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than expected. In 2021 the same study found that the footballers' overall risk of developing brain problems was related to position on the field (defenders were most vulnerable) and to the length of their career. Those involved in the study say that these findings, along with post-mortem work, show that head injuries are an important risk factor for neurodegenerative disease in footballers.

Dark forebodings

A new study published this month in *Brain Communications* finds the age of first exposure to American football, and years played, both had an association with less white matter in the brain and with impulsive behaviour. White matter is the neurological wiring that connects the neurons within the brain. This all points to a "dose-response" relationship. In other words, more blows to the head seem to increase the risks of long-term damage.

In 2022 a different study in *Brain Communications* looked at the brains of 44 active elite rugby players (including three women) and compared these with control groups comprising people playing non-collision sports, and those outside sport entirely. In addition, brain scans of some of the players were taken a year apart. The researchers found that, whether or not players had had a recent head injury, ten of them had abnormalities in their white matter that indicated disrupted nerve fibres. There were also small tears in blood vessels that had caused bleeds in three of the rugby players. In those players who had had brain scans, half were found to have reductions in brain volume over the year.

Crucially, the problems were also seen in players who did not exhibit any of the classic symptoms of concussions. However, while the study's findings were alarming, a short-term study such as this is not able to prove that these players will have a higher risk of neurological difficulties later in life. For that, longer term imaging studies would be needed.

How TBIs might contribute to longer-term neurological conditions such as dementia is less clear. One theory, says Neil Graham, a neurologist at Imperial College London, is that a TBI may trigger a neurodegenerative process that propagates over time. That idea is supported by work in animals that show injuries to axons—the long threadlike parts of neurons that connect different cells and transmit electrical signals—can generate abnormal forms of brain proteins such as tau and amyloid. These may clump together and spread through the brain. Clumps of abnormal proteins such as these are one of the proposed causes for Alzheimer's disease.

Dr Graham also says that better technology is needed to understand what is happening to players during games. Simply observing how someone behaves on the pitch after a blow to the head can be misleading. "We need to shift towards using biomarkers such as ultrasensitive blood tests so we can get objective data," he says. Research into blood and saliva tests shows that these could give clues to what is going on inside the brain by looking for molecular biomarkers—including tau, glial fibrillary acidic protein and ubiquitin C-terminal hydrolase L1—that spike in the blood within hours of an injury. The recent approval, in America, of a blood test for mild TBI shows it will soon be possible to identify and measure such an injury objectively, perhaps even at the pitch-side. Sports governing bodies have typically not made use of such technologies in the past, but that could be changing. World Rugby is testing mouthguards containing accelerometers, which can measure the forces players are being subjected to during games.

Spot the damage

Although the science is becoming clearer, it will remain difficult for individual players with dementia or related problems to prove causation. They need to show that, on the balance of probabilities, what happened decades ago caused the problems they suffer from now, explains Jack Anderson, a professor of sports law at the University of Melbourne. This will be difficult, not least because relevant medical records may not have survived. Much of the players' case will rely on the advances in medical imaging, alongside epidemiological evidence that aims to link brain injuries and their probable cause.

In 2021, after the lawsuit against it was announced, World Rugby published a six-point plan committing it to improving player welfare. The organisation is also conducting its own research into head impacts, reviewing existing laws and, it maintains, devising its policy assuming that there is a link between repeated head impacts and CTE. But progress has been slow. There are routine examples of sportsmen and women who receive brutal blows to the head on the pitch, yet continue to play. World Rugby says such incidents are reviewed and team doctors who are found to have erred in their judgment can be sent for further training or even disciplinary action. Official recommendations state that, during training, players should have only 15 minutes of contact time per week, ie where they can collide at full speed as they might in a game. But that guidance does little to restrain clubs and players hungry for a competitive edge.

James Drake, chairman of the Drake Foundation, a non-profit that funds research into the long-term health effects of a career in sports, also points to evidence that the game was probably safer in rugby's amateur era. As it has become more professional, players have become bigger. In the past, players had to be quick and agile; now it is a collision sport. In football, where English players have launched their own rugby-style negligence claim, the Professional Footballers' Association has created a "brain-health department" to help lobby for stronger concussion protocols and to care for former players with dementia. They are also trying to raise awareness among current and future players of the potential dangers of heading the ball.

To widen the evidence base, former athletes from a range of sports are donating their brains for medical research. The "brain bank" at Boston University contains more than 700 brains with CTE, mostly belonging to former athletes (see image). As of February, 345 of the 376 brains of NFL players studied at the brain bank had been diagnosed with CTE. The figures contrast sharply with the very low rates of CTE found in the brains of non-athletes, although the brain-bank samples are subject to selection biases.

Playing different tunes

The rugby lawsuits, as with the NFL cases a decade ago, will probably end in a settlement. A recent ruling in Los Angeles showed how difficult it can be to prove these cases—a jury there rejected a $55m lawsuit by the widow of a former American football player, who alleged that the 6,000 hits her husband endured during his career caused him permanent brain damage and resulted in his death at the age of 49.

For the claimants, their case is about far more than compensation. Mr Popham says that, if an offer to settle came, he would only do so if new rules were put into place to make rugby safer to play. "I watch rugby through different eyes now with what I know," he says. The evidence as yet may not be definitive. But one way or another, Mr Popham and his peers are determined to make rugby a very different game. ■

Immunology

Give it a rest

To ensure vaccines work properly, get a good night's sleep

VACCINES GET all the glory, but it is really the immune system that does the heavy lifting. Indeed, those with weak immune systems often benefit little from vaccines. Aware of this, researchers have long thought that people deprived of sleep also ought to benefit less from vaccines, as sleeping less is thought to reduce immune function. A new analysis reveals that this is clearly the case—though only in men.

The immune system is metabolically expensive for the body to operate. When resources run low, it cannot function as well as it might when well supported. This is why people who are profoundly cold for long periods of time tend to fall ill—their bodies are burning calories to stay warm that might otherwise have been used to fuel their defence.

The immune system is similarly hamstrung by a lack of sleep since a number of its key components, such as the white blood cells that produce antibodies, are predominantly made by the body when a person is slumbering. Yet it has remained unclear whether poor sleep at a time of vaccination leads to reduced immune benefits.

Vaccines work by presenting the immune system with the foreign material of a pathogen. The system reacts by making antibodies, though these do not last for ever—they circulate in great numbers shortly after a real or vaccine-induced invasion but their population wanes over time. Eventually, another shot of vaccine is needed to boost the antibody count.

For their study, Karine Spiegel at the French National Institute of Health and Medical Research and Eve Van Cauter at the University of Chicago speculated that insufficient sleep might damage the ability of the immune system to react to vaccines and thus result in fewer circulating antibodies. They pooled the results of seven studies in which a total of 603 participants between the ages of 18 and 60 had had their antibody response to vaccines monitored and who had also been asked how many hours of sleep they were getting each night.

Dr Spiegel found that men showed a strong relationship between insufficient sleep (defined as fewer than six hours of kip a day) and antibody response. The magnitude of the effect, when sleep duration was recorded objectively by a lab rather than self-reported by a patient, was similar to the amount of antibody waning seen in an average person two months after being given the Pfizer-BioNTech covid-19 jab. The vaccines given to sleep-deprived men, therefore, still provided protection but the effect was less potent from the start and lasted for less time, on average.

The results were published this week in *Current Biology*. Dr Spiegel says that encouraging patients to get plenty of sleep before and after a vaccination appointment is an ideal way for a medical system to maximise its vaccine stock and ensure that the benefits granted are as large as possible.

As for why the results in women were not significant, Dr Spiegel and her colleagues theorise that sleep affects female response to vaccines too but that hormone interference, driven by varying stages of the menstrual cycle, contraception and hormone-replacement therapies, is probably altering immune response in profound and unknown ways that throw off the results. It is a subject area that urgently needs more attention, argue the researchers.

Vaccines are an important tool in the world's armoury against disease and there is no getting around the fact that developing and adminstering them is a difficult and expensive process. But patients could at least be encouraged to give their immune system a rest before getting jabbed. It costs nothing, and could pay considerable dividends.

Night night, don't let the viruses bite

Neuroscience

Mind mapping

Knowing the structure of the larval fruit-fly brain is just the start

THE COGNITIVE abilities of a fruit-fly larva may not seem particularly noteworthy. This creature—the fly's early, worm-like phase—is just about capable of sensing its environment, searching for food and avoiding predators. Its brain does not yet know how to walk, fly, or even properly see. And yet its limited capacity is still, in miniature, a useful model for what larger and more complex brains can do.

Researchers have now published the first complete map of the brain of such a larva. This "connectome"—the equivalent of a three-dimensional circuit diagram—charts the locations of a brain's neurons as well as the synapses, the junctions where the brain cells pass information between each other. The structures of these circuits influence the kinds of computations a brain can do. Knowing how neurons are interconnected can give scientists a more mechanistic understanding of how the brain functions.

Until now, the production of connectomes has been limited to those of simpler organisms such as the nematode worm, whose brains have hundreds of neurons and in which complex behaviour has not yet been observed. Small portions of larger brains—including the fruit fly itself—have also been mapped. Never before, though, has the whole brain of such a complex organism—spanning some 548,000 connections between 3,016 neurons in the case of the fruit-fly larva—been mapped.

The latest work, published in *Science*, marks the culmination of over a decade's worth of effort, started at the Janelia Research Campus in Virginia, as part of its FlyEM project. The first step involved slicing the tiny larval brain into thousands of layers for scanning with an electron microscope (the EM of the name). Researchers then painstakingly labelled and analysed the images, mapping out areas associated with functions such as vision, for example, or olfaction.

The connectome of the fruit-fly larva has already provided insights. For example, regions of the creature's brain associated with learning had more loops in their circuitry, with downstream neurons connecting back to those close behind them, than other regions of the brain. This suggested some repeat processing of signals. One proposed explanation is that such loops encode predictions, and that the creatures learn by comparing these with real experiences in their environment.

Information about the taste of a leaf, for example, might enter a neuron at the same time as a prediction based on previous meals. If the taste differs from prediction, the neuron may secrete dopamine, a chemical capable of rewiring the circuitry to create a new memory.

Biologists have much to learn from connectomes. Marta Zlatic, a neuroscientist at the University of Cambridge and an author of the latest research, envisages a connectome study programme with three steps. First, a connectome is mapped. Second, the activity patterns in a living brain are imaged while an animal carries out a set of tasks. And third, these two sets of information are combined to pinpoint variations in brain structure worth manipulating or breeding in the lab. That would help to test hypotheses between individuals with different brain structures.

In order to understand the origins of intentionality, for example, or how a fly decides to perform an activity such as moving forward, an individual's brain would be scanned while it moved. Then, the regions that showed activity would be analysed in the connectome. Other flies could have those specific brain circuits silenced and, by comparing the behaviours of the different individuals, scientists would be able to pinpoint the role played by specific brain regions in how a fly carries out an activity. "The future", says Dr Zlatic, "is comparative connectomics."

This now seems achievable. Even in the decade since this larva was imaged, technology has advanced dramatically. The nanoscale salami-slicing involved in EM can now be done in weeks, rather than years. Analysis could also be sped up: now that the painstaking work of labelling the larval connectome has already been done by hand, a machine could be taught to do it again on a different individual's brain.

Dozens of groups are forging ahead. Another branch of the FlyEM team is tackling the adult fruit-fly connectome, which has ten times more neurons and a vastly larger visual cortex. Other groups are facing down the zebrafish, a relatively tractable vertebrate. The biggest game in the crosshairs at the moment, though, is the mouse. With a brain volume a thousand times bigger than the fruit fly's, researchers are currently advancing one cubic millimetre at a time. Still, says Moritz Helmstaedter at the Max Planck Institute for Brain Research in Frankfurt, who leads one such project, a full mouse connectome is eminently achievable, even if it is also several hundred million dollars away.

Of course, the ultimate prize is the human brain, a thousand times bigger still and vastly more complex. But when, if ever, that can be given the full connectome treatment remains to be seen. ■

Space exploration

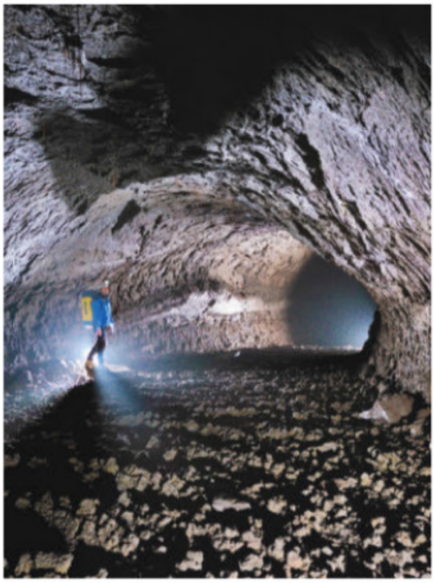
Lunar living

Pressurised natural caves could offer a home from home on the Moon

IMAGINE A HABITABLE colony on Mars or the Moon and the kinds of structures that come to mind are probably gleaming domes or shiny metallic tubes snaking over the surface. But with no Earth-like atmosphere or magnetic field to repel solar radiation and micrometeorites, space colonists would probably need to pile metres-thick rocks and geological rubble onto the roofs of such off-world settlements. More like a hobbit hole than *Moonbase Alpha*.

There could be another solution, however, that would offer future colonists safer and far more expansive living space than any cramped base built on the surface. Writing in *Acta Astronautica*, Raymond Martin, an engineer at Blue Origin, a rocket company, and Haym Benaroya, an aerospace engineer at Rutgers University, explore the benefits of setting up a Moon base inside giant geological tunnels that lie just below the lunar surface.

First discovered during the Apollo programme, these lunar lava tubes are a legacy of when Earth's nearest celestial neighbour was geologically hyperactive, with streams of boiling basaltic magma bursting from the interior to flow across the Moon's surface as lava. Found on Earth (see picture), and identified on Mars, lava tubes form when the sluggish top layer of a lava stream slows and cools, forming a thick and rocky lid that is left behind when the rest of the lava underneath eventually drains away.



Spelunking in space

Lava tubes on Earth are usually up to 15 metres wide and can run for several kilometres. But the reduced gravity on the Moon makes them hundreds of times bigger, creating colossal cave systems that are up to a kilometre across and hundreds of kilometres long.

Space scientists have long identified these lava caves as a likely site for human habitation on the Moon, because the thick walls and ceiling offer protection from the harsh radiation striking the Moon's surface. But Mr Martin and Dr Benaroya went a step further. Rather than simply situating a Moon base inside a lava tube—domes and shiny buildings and all—they suggested that a section of such a tube could be pressurised with breathable air. Residents could live, work and sleep inside the pressurised tubes with no need for space suits and with plenty of spare real estate for some low-gravity recreation. And although the costs and details need more planning, it could end up cheaper than having to send from Earth everything needed to survive on the lunar surface.

In their latest study, the two scientists crunched some numbers on what might be possible. "One of the first big hurdles there is proving that they [the lava tubes] are structurally sound," says Mr Martin. To find out, he and Dr Benaroya built a computer model to simulate the integrity of a relatively small lava tube in the Moon's Oceanus Procellarum (Ocean of Storms), which was photographed by the Indian *Chandrayaan-1* lunar probe 15 years ago.

After checking several combinations of internal pressure and roof thickness, and whether the resulting structure was stable, the study suggested a lava tube with a roof thickness of ten metres could be safely pressurised to almost the same conditions found at sea level on Earth. The scientists also showed that the overall pressure (and so the risk of roof failure) could be reduced by increasing the proportion of oxygen in the artificial air used to fill the caverns. And given the awkwardness of moving around in a space suit, the study looked at how astronauts could get themselves and their equipment safely in and out of the tubes. The best option, it concluded, would be to build the entrance where a wall of the lava tube had naturally collapsed open.

Knowing that the roof will not fall in should give engineers the confidence to work on other aspects of the idea, such as how to use inflatable structures to cap the ends of a pressurised section of the tube. Such membranes are already used for flood prevention in tunnels on Earth, where they can be quickly deployed to block incoming floodwater. Another issue is whether the lava tube's ceiling would be fully airtight, and if not, how to seal it to prevent leaks. And, of course, how to prepare humanity for a return to life in caves. ■

Culture

American society

Small mercies

A passionate denunciation of poverty offers more outrage than solutions

Poverty, By America. By Matthew Desmond. *Crown; 304 pages; $28. Allen Lane; £25*

For the richest country in history, poverty in America remains jarringly widespread. Taking government assistance into account, one in eight American adults was classified as poor on the eve of the pandemic: a smaller share than in previous decades but still a big slice of the population. Every now and then, a polemic on the subject cuts through the routine news and statistics to induce shame, or even, in rare cases, spur change.

In 1962 the social activist Michael Harrington published "The Other America", an exposé of the invisible poor who—on his reading of government income figures—included as many as half of senior citizens. The book was credited with helping to inspire the national "War on Poverty" that President Lyndon Johnson launched a couple of years later. In "The Colour of Law" (2017), Richard Rothstein chronicled the prejudiced governmental programmes that denied mortgages to African-Americans and contributed to urban segregation, which still blights opportunity today. The book popularised the term "redlining".

Published in 2016, Matthew Desmond's study of housing insecurity in America, "Evicted", was another book with a big impact. It won a Pulitzer prize for its author, a sociologist at Princeton University, and became one of the most influential works of social science of its decade. His follow-up, "Poverty, By America", is about the persistent problem of poverty and its causes. Though he writes movingly about the psychological scars of poverty, this book lacks the anthropological research and in-depth analysis that distinguished its predecessor. In its own way, though, it is useful: it shows the shortcomings of an approach that dismisses incremental gains and prioritises piety over real-world policies.

Poverty, Mr Desmond argues, is not complicated but simple. There is so much of it in America, he writes, because many Americans like it that way. Wittingly or otherwise, the country's citizens conspire to exploit the poor. They crush unions, enjoy goods and services produced on paltry wages, trap their compatriots in slums and slant the tax code for the benefit of the better-off. Absolution for this moral sickness, the author says, should come through a new project of "poverty abolitionism".

Hope over experience

Many fine books on American poverty criticise capitalism and go in for intermittent moralising. It is indeed a moral failing that America continues to have a high rate of child poverty. But in this book, moral certainty and righteousness are the main substance of the argument.

Mr Desmond actively disparages nuance. "Hungry people want bread," he notes. In response, "the rich convene a panel of experts. Complexity is the refuge of the powerful." His policy analysis, when

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78 Johnson: The uses of redundancy

he gets to it, is cursory, somewhat contradictory and largely unconcerned with alternative explanations. He dismisses the prominent thesis that urban poverty is a result of deindustrialisation in a single short paragraph (which mostly gripes about the ugliness of that term).

The trillions spent on anti-poverty initiatives have achieved little, Mr Desmond argues fatalistically. "There is no real improvement here," he writes, "just a long stasis." Programmes that top up the wages of low-income workers—so providing money for food and other essentials—wind up subsidising exploitative firms and slumlords, he alleges. In fact, analysis by the sort of expert panel he dislikes, including one at Columbia University, shows that this kind of welfare spending has kept millions out of poverty (currently defined, for a family of four, as living on just under $30,000 a year). Poor children caught by such safety-net schemes experience gains later in life, too.

Despite his critique of anti-poverty spending, one of Mr Desmond's main solutions is to boost it considerably, by ensuring everyone is paid enough to stay above the poverty line. In the year 2020, he calculates, that would have taken roughly $177bn on top of existing welfare spending (he does not specify whether that cost would recur). He denounces those who might query this endeavour: "*How can we afford it?* What a sinful question. What a selfish, dishonest question, one asked as if the answer wasn't staring us in the face." Possible unintended consequences, such as the risk of disincentivising work, are also unworthy of serious discussion.

"Evicted" was gripping in part because it drew on years of research in the slums of Milwaukee. "Poverty, By America" does not build on case studies in the same way (though some of the earlier material is recycled). Mr Desmond remains a talented writer, and his prose can be crisp, elegant and elegiac. "Poverty is often material scarcity piled on chronic pain piled on depression piled on addiction," he explains. "Poverty isn't a line. It's a tight knot of social maladies." In other passages, though, the style is botched. His peroration—"We don't need to outsmart this problem. We need to out-hate it"—is less stirring than it seems meant to be.

The bad old days

The book is strongest when it revisits the problem of rental housing, showing how those with little choice but to live in dreadful flats are obliged to pay scandalous rents—as well as the egregious way the federal government subsidises home ownership for the already wealthy. Mr Desmond is right to say that the poor are harmed by America's segregation into islands of affluence and pits of concentrated poverty. But technocratic solutions for this interest him less than self-flagellation. "Maybe above a certain income level, we are all segregationists," he muses.

Pessimism addles judgment. The assertions that "the United States now offers some of the lowest wages in the industrialised world", and that America has created a "welfare state that heavily favours the upper class", are both, at best, deeply questionable readings of the data. Mr Desmond's reverence for the American *trente glorieuses* from the late 1940s to the late 1970s—his view that "things weren't always this bad", because, in the olden days, the unions were riding high—is inconsistent with the dire poverty Harrington depicted in his book, and which set off Johnson's nationwide "war".

Mr Desmond portrays himself as a warrior against the "propaganda of capitalism", which caricatures the poor as undeserving and denies that the capitalist system "is inherently about workers trying to get as much, and owners trying to give as little, as possible". Yet the contest of ideas and interests need not be zero-sum. Many industrialised countries manage to have both vibrant market economies and low poverty rates because they redistribute a bit more, and a bit more intelligently.

The author wants readers to become "poverty abolitionists". That means, for instance, only buying beer or sweets that are made with unionised labour. Such recommendations may be worthy, but they are less practical than technocratic policies such as expanding tax credits for children. In 2021 a nationwide trial of that programme saw the child-poverty rate drop by almost half (it rose again when the trial ended). It was a heartening success on which Mr Desmond does not dwell.

Poverty is a blight. Shame is one way to publicise it; exposing the suffering it involves is salutary. But the hardship is more likely to be relieved in future if Americans recognise the progress made in the past. ■

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True crime

Her cruel device

The Angel Makers. By Patti McCracken. *William Morrow; 336 pages; $32.99. Mudlark; £16.99*

When the people of Nagyrev had a problem, they went to Auntie Suzy. Though she had no formal training, she was the Hungarian village's appointed midwife and the closest thing it had to a resident doctor. Men used her homemade tinctures for relief from the aches and pains they sustained toiling in the fields. Women, too, turned to her for help, and not just with the delivery of their babies. Alongside rubs and salves, Auntie Suzy produced another concoction: arsenic, made from boiling flypaper in vinegar.

Some women used the solution out of desperation—to avoid having another mouth to feed or to get rid of a violent spouse or relative. Others, however, dispensed it to deal with less urgent personal inconveniences. One woman had tired of her clingy husband, so fed him contaminated duck soup. Another, weary of her adult son, mixed some of the elixir into his goulash; later, when she suspected her third husband of having an affair, she reprised her technique. The arsenic was an open secret. If a woman complained of her partner's behaviour, a friend would suggest a visit to the midwife.

Patti McCracken's new book, "The Angel Makers", is a detailed account of the killing spree in Nagyrev and other nearby villages in the early 20th century. It took prosecutors several years to grasp its scale. Eventually 29 women and two men were put on trial in 1929 for the murders of 42 men; 16 women were convicted. Scores of bodies were exhumed and examined for traces of arsenic. Some think as many as 300 people could have been killed. "The boldness and utter callousness with which they carried on their criminal activities seems to have been equalled only by the stupidity of the men who were their victims," the *New York Times* reported.

The author weaves in character sketches that suggest the perpetrators' various motives. Her portrait of Auntie Suzy, a buxom woman fond of her pipe and brandy, is particularly evocative. When questioned by the police about a pattern of infant deaths, she described her role in benevolent terms: she helped poor people with family planning. In fact, she was motivated by money and status.

She plundered goods from clients' homes and charged exorbitant fees for her potions. (From Maria, the woman who killed her son and husband, she hoped to extract a house.) Occasionally Auntie Suzy or one of her helpers would bump someone off unprompted. A baby was killed without the mother's say-so. A war veteran was dispatched so that Auntie Suzy's son might marry his wealthy widow.

Ms McCracken also lays out the context in which these misdeeds took place. She describes regional customs and the effects on the village of the first world war and the fall of the Austro-Hungarian empire. Nagyrev was surrounded almost entirely by the Tisza river, which often flooded and cut off its inhabitants from the outside world. It was a place making a slow transition from old ways of living to newfangled bureaucracy, and from the methods of Romani healers to modern medicine.

This macabre story offers two enduring lessons. One is the importance of women having control over whether and when they have children. Another is the value of well-funded public services. Letters, written anonymously, had repeatedly raised the alarm about suspicious deaths in the area. A visiting doctor even requested an investigation, but there was no money to pay for one. The local government was busy renovating the courthouse and, somewhat ironically, the prison.

Readers may also draw a third, more troubling conclusion. Auntie Suzy pledged—wrongly, as it turned out—that "not even a hundred doctors" would be able to detect her poison in its victims. The women thought they could get away with murder and their approach became alarmingly casual. Lots of people could take another life, this episode suggests, given the opportunity, even the slightest of motives and an assurance of impunity. ■

Intellectual history

Leaps of faith

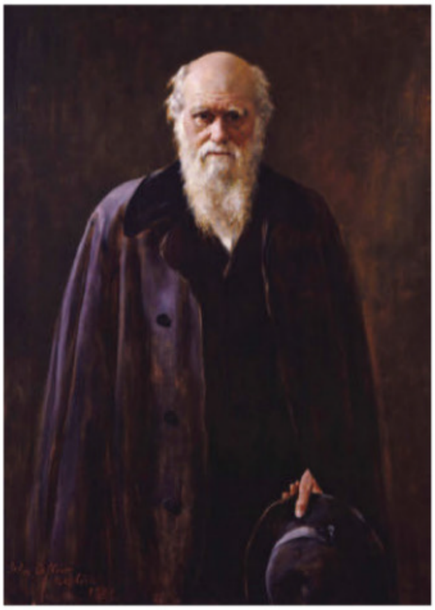
Science and religion need not be antagonistic, says an arresting history

Magisteria. By Nicholas Spencer. *Oneworld; 480 pages; £25. To be published in America in May; $32*

IN THE LATE 19th century two books on science and religion were published within a decade of each other. In "The Creed of Science" William Graham tried to reconcile new scientific ideas with faith. In 1881 Charles Darwin, by then an agnostic, told him: "You have expressed my inward conviction, though far more vividly and clearly than I could have done, that the Universe is not the result of chance."

The other book made a much bigger splash. "History of the Conflict Between Religion and Science" by John William Draper was one of the first post-Darwinian tomes to advance the view that—as its title suggests—science and religion are strongly antithetical. Promoted hard by its publisher, the book went through 50 printings in America and 24 in Britain and was translated into at least ten languages. Draper's bestseller told a story of antagonism that, ever since, has been the mainstream way to see this relationship.

In "Magisteria", his illuminating new book, Nicholas Spencer claims that this framing, more recently espoused by Richard Dawkins and others, is misleading. For centuries, he says, science and religion have been "endlessly and fascinatingly entangled". Even (or especially) those readers inclined to disagree with him will find his narrative refreshing.



Darwin's children

Mr Spencer works at Theos, a religious think-tank in London, and is one of Britain's most astute observers of religious affairs. Some conflict between science and religion is understandable, he argues, but not inevitable. He offers an engaging tour of the intersection of religious and scientific history: from ancient science in which "the divine was everywhere", to the Abbasid caliphate in Baghdad in the ninth century and Maimonides, an illustrious Jewish thinker of the 12th—and onwards, eventually, to artificial intelligence. Now and again he launches salvoes against ideologues on both sides.

"Medieval science" is not an oxymoron, he writes. Nor is religious rationalism. In the 11th century Berengar of Tours held that "it is by his reason that man resembles God." As religious dissent spread following the Reformation, Mr Spencer says, theology helped incubate modern science through the propagation of doubt about institutions and the cracking open of orthodoxies. For their part, an emergent tribe of naturalists strove, chisel and hammer in hand, to show that creation pointed towards a creator. Exploration of nature was itself a form of worship.

Mr Spencer insightfully revisits the dust-ups involving Galileo, Darwin and John Scopes (prosecuted in Tennessee in 1925 for teaching evolution). He traces the interaction of the two disciplines in often fascinating detail. Many pioneering scientists lived in times of religious and political strife and found in "natural philosophy", as pre-modern science was known, a "ministry of reconciliation". Thomas Sprat, dean of Westminster and biographer of the Royal Society, opined in 1667 that, in their experiments, men "may agree, or dissent, without faction, or fierceness". That was not always true, as Isaac Newton's spats with his peers showed. Still, says Mr Spencer, by supplying an arena for calmer debate that was beyond clerical control, "Science saved religion from itself."

The roll call of scientists who were people of faith runs from Michael Faraday and James Clerk Maxwell to Gregor Mendel and Georges Lemaître, a Belgian priest who, on the basis of mathematical calculations, first proposed that the universe was expanding and therefore had a beginning. In 1933 Lemaître made what, for Mr Spencer, is a key observation: "Neither St Paul nor Moses had the slightest idea of relativity." The writers of the Bible could see into "the question of salvation. On other questions they were as wise or as ignorant as their generation." In other words, science and religion are not different attempts to do the same thing. Lemaître warned the pope against drawing any theological conclusions from his work on the cosmos.

Mutual hostility has risen in recent decades. Sociobiology now seeks to explain all human life and behaviour, including morality and the mind, in terms of evolution. As well as clinging to a morality derived from scripture, some religious zealots still reject Darwin's theory altogether. Mr Spencer thinks it is "disciplinary overreach" for either side to dismiss the other entirely. "Neuroscience stands no more chance of finding morality or the soul in an MRI scan than ethicists or theologians will locate evidence for frontal lobe activity in the 'Nicomachean Ethics' or the Bible."

In "Rocks of Ages" (published in 1999), Stephen Jay Gould, an evolutionary biologist, argued that the tension between science and religion "exists only in people's minds…not in the logic or proper utility of these entirely different [subjects]". He coined the phrase "non-overlapping magisteria" to describe their relationship. One covers the empirical realm, the other the realm of values. Mr Spencer does not think the division is quite so clean-cut. "Science and religion are partially overlapping magisteria," he thinks. "They overlap within us." In other words, humans are complex, and should be able to tolerate complexity without declaring war. ■

Johnson More is more

Redundancy can be useful in writing and speech. Here's when, why and how

"PLEASE RETURN your tray tables to their full upright and locked position." "Remember to take all of your personal belongings with you when you leave the train." Something about writing announcements for public transport seems to bring out the wordiness in people. These instructions can be shortened to "Please put your trays up" and "Please take your things."

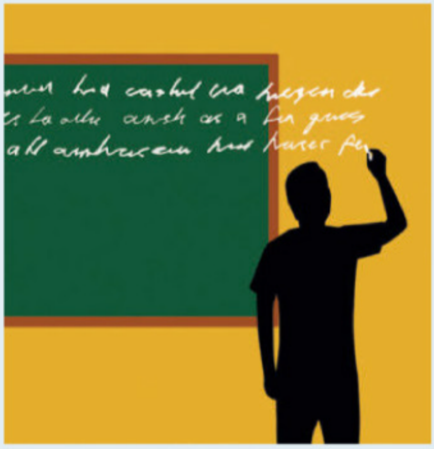
Redundancy is widely seen as a stylistic sin. "Omit needless words" is perhaps the least redundant statement of this view, made famous by "The Elements of Style", a bestselling usage manual published in 1959. In it, E.B. White, an essayist and novelist, attributed the dictum to his university English teacher, William Strunk. In the classroom, Strunk "omitted so many needless words" that he was often "left with nothing more to say, yet with time to fill". So Strunk resorted to saying everything three times: "Omit needless words! Omit needless words! Omit needless words!"

On reflection, though, did he really need to say that three times himself? If he had already said everything that was required, he could have let the class out early rather than repeating his call for concision. That he did so suggests there may be more value in redundancy than meets the eye. Language scholars, indeed, think it fulfils several functions.

One, hinted at by Strunk's repetition, is learnability. Repetition, after all, is reinforcement. Languages that include the same piece of grammatical information in more than one way are probably more easily acquired by children, or indeed adults. For example, the *-ed* ending on the verb gives no new information in "Yesterday, he walked", because "yesterday" already situates the event in the past. Many languages—Mandarin, for example—do not require such endings. In those, such as English, which do, the doubling up of signals may have developed to make them easier to learn.

Another benefit of redundancy can be seen on those trains and planes. These are noisy and distracting places where a brusque "Please take your things" may not be heard by all passengers. Redundancy makes a signal robust. For instance, spacecraft beaming digital messages to Earth include "error-correction bits", redundancies in the signal that allow engineers back home to reconstruct the inevitably degraded transmissions. Here redundancy is a feature not a flaw.

A recent study of Dutch and English confirmed this is true of human languages, too. It looked at how both languages handle sentences like "She gave the book to him": ie, those with both a direct object, "the book", and an indirect one, "him". In both Dutch and English, word order is relatively fixed for the giver, thing given and recipient. But there are also ways of emphasising this information. The pronoun "She" is in the nominative case, marking it as the subject or giver. "Him" is in the objective case, making clear that it is an object (it is not "he"). Strictly, either the form of the pronouns or the word order could distinguish giver from recipient, but most such sentences in English and Dutch offer both.



Languages may even adapt to maintain an optimal level of redundancy. A thousand years ago, every English noun—"king", say, or "Alfred"—changed forms, as "he" does to "him", to show which role every word played in a sentence (subject, direct object and so on). Over the centuries those endings disappeared, potentially making sentences ambiguous. The grammar of English responded by making word order, which had once been fluid, more rigid. And English still employs other features—such as the use of the preposition "to", or the objective-case forms "him" and "her"—just in case.

Another possible use of redundancy is simply to make listening or reading less taxing. If every possible word that can be removed is removed, so that every remaining one is absolutely crucial, listening and reading become stressful. You cannot let your mind wander for even a moment. Such prose is almost too dense with information; even a short passage of this kind would be demanding to read. Sometimes a little room to breathe is no bad thing.

Just a little, that is. The advice to keep it trim is still good counsel. Blaise Pascal, a French author of the 17th century, once apologised for a long letter by saying: "I have not had time to make it shorter." Keeping things tight can be hard work for the writer, but it saves time for the reader, at least up to a point. Make your prose as lean as necessary to keep your reader reading—but not more.

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Economic data

	Gross domestic product				Consumer prices			Unemployment rate		Current-account balance	Budget balance	Interest rates			Currency units	
	% change on year ago latest		quarter*	2023†	% change on year ago latest		2023†	%		% of GDP, 2023†	% of GDP, 2023†	10-yr gov't bonds latest,%		change on year ago, bp	per $ Mar 15th	% change on year ago
United States	0.9	Q4	2.7	0.7	6.0	Feb	4.0	3.6	Feb	-3.0	-5.2	3.5		136	-	
China	2.9	Q4	nil	5.7	1.0	Feb	2.1	5.6	Feb‡§	1.9	-2.7	2.7	§§	15.0	6.90	-7.5
Japan	0.4	Q4	0.1	1.0	4.4	Jan	1.9	2.4	Jan	3.0	-5.9	nil		-8.0	133	-11.0
Britain	0.4	Q4	0.1	-0.3	10.1	Jan	5.9	3.7	Dec††	-3.2	-5.4	3.4		189	0.83	-7.2
Canada	2.1	Q4	nil	0.8	5.9	Jan	3.4	5.0	Feb	-1.2	-1.1	2.8		60.0	1.38	-7.2
Euro area	1.8	Q4	-0.1	0.7	8.5	Feb	5.8	6.6	Jan	1.1	-3.5	2.2		185	0.95	-4.2
Austria	2.6	Q4	-0.1‡	0.8	11.0	Feb	6.6	5.1	Jan	-0.6	-3.5	2.9		214	0.95	-4.2
Belgium	1.4	Q4	0.4	0.4	6.6	Feb	6.1	5.8	Jan	-1.9	-5.3	2.9		208	0.95	-4.2
France	0.5	Q4	0.3	0.5	6.3	Feb	5.0	7.1	Jan	-1.9	-5.3	2.8		210	0.95	-4.2
Germany	0.9	Q4	-1.7	-0.1	8.7	Feb	6.2	3.0	Jan	3.5	-2.0	2.2		185	0.95	-4.2
Greece	4.5	Q4	5.6	1.0	6.1	Feb	4.1	10.8	Jan	-7.0	-3.5	4.2		154	0.95	-4.2
Italy	1.4	Q4	-0.5	0.6	9.2	Feb	6.8	7.9	Jan	-0.5	-4.8	4.1		223	0.95	-4.2
Netherlands	3.0	Q4	2.5	0.7	8.0	Feb	7.1	3.6	Jan	6.3	-2.7	2.5		196	0.95	-4.2
Spain	2.7	Q4	0.9	1.4	6.0	Feb	4.3	13.0	Jan	0.3	-4.7	3.4		212	0.95	-4.2
Czech Republic	0.1	Q4	-1.4	-0.2	16.7	Feb	9.9	2.6	Jan‡	-1.0	-4.6	4.5		80.0	22.8	-0.8
Denmark	1.7	Q4	3.5	0.8	7.6	Feb	5.0	2.8	Jan	9.0	0.5	2.5		184	7.07	-4.1
Norway	1.3	Q4	0.8	1.4	6.3	Feb	4.6	3.4	Dec‡‡	20.0	11.4	1.4		76.0	10.8	-16.7
Poland	0.6	Q4	-9.3	1.3	18.4	Feb	12.6	5.5	Feb§	-1.9	-3.0	6.0		108	4.46	-3.4
Russia	-3.7	Q3	na	-2.4	11.0	Feb	7.3	3.6	Jan§	6.8	-4.6	10.8		-168	76.1	40.9
Sweden	-0.1	Q4	-2.0	-0.6	12.0	Feb	5.6	7.6	Jan§	3.0	-0.3	2.3		152	10.6	-9.5
Switzerland	0.8	Q4	0.1	0.9	3.4	Feb	2.2	1.9	Feb	6.5	-0.7	1.1		73.0	0.92	2.2
Turkey	3.5	Q4	3.8	2.8	55.2	Feb	42.2	10.3	Jan§	-4.4	-3.8	11.0		-1343	19.0	-22.5
Australia	2.7	Q4	1.9	1.6	7.8	Q4	4.2	3.5	Feb	1.1	-2.1	3.4		92.0	1.51	-8.0
Hong Kong	-4.2	Q4	nil	3.4	2.4	Jan	2.3	3.4	Jan‡‡	3.5	-1.4	3.5		146	7.85	-0.2
India	4.4	Q4	-3.4	5.4	6.4	Feb	5.3	7.5	Feb	-1.4	-5.9	7.4		54.0	82.6	-7.2
Indonesia	5.0	Q4	na	4.7	5.5	Feb	3.9	5.9	Q3§	0.8	-2.8	6.8		2.0	15,365	-6.7
Malaysia	7.0	Q4	na	3.5	3.7	Jan	2.3	3.6	Jan§	2.9	-5.2	3.9		25.0	4.48	-6.0
Pakistan	6.2	2022**	na	2.2	31.5	Feb	9.9	6.3	2021	-4.9	-5.4	15.7	†††	409	282	-36.4
Philippines	7.2	Q4	10.0	4.8	8.6	Feb	5.7	4.8	Q1§	-3.0	-6.4	6.2		63.0	55.0	-4.6
Singapore	2.1	Q4	0.3	1.7	6.6	Jan	3.3	2.0	Q4	17.2	-0.1	3.0		96.0	1.35	1.5
South Korea	1.3	Q4	-1.6	1.3	4.8	Feb	2.8	3.1	Feb§	2.7	-2.4	3.4		66.0	1,304	-4.7
Taiwan	-0.4	Q4	-1.5	1.9	2.4	Feb	1.6	3.6	Jan	11.8	-2.2	1.2		40.0	30.6	-6.4
Thailand	1.4	Q4	-5.9	3.8	3.8	Feb	2.5	1.0	Dec§	2.1	-2.6	2.5		27.0	34.6	-3.1
Argentina	5.9	Q3	7.0	-0.2	102	Feb	90.6	7.1	Q3§	-1.0	-3.9	na		na	203	-46.0
Brazil	1.9	Q4	-0.9	1.0	5.6	Feb	4.8	7.9	Dec§‡‡	-3.0	-8.1	13.2		98.0	5.31	-3.2
Chile	0.3	Q3	-4.6	-0.6	11.9	Feb	7.5	8.0	Jan§‡‡	-4.3	-2.6	5.4		-59.0	823	-1.0
Colombia	2.9	Q4	2.7	1.6	13.3	Feb	10.6	13.7	Jan§	-4.7	-4.4	12.5		277	4,835	-20.5
Mexico	3.6	Q4	1.8	1.1	7.6	Feb	5.9	2.9	Jan	-1.1	-3.8	9.0		38.0	19.0	10.2
Peru	1.7	Q4	-6.0	1.9	8.6	Feb	6.5	7.0	Feb§	-3.3	-1.6	8.0		135	3.80	-1.6
Egypt	4.4	Q3	na	3.0	32.0	Feb	19.2	7.2	Q4§	-2.9	-6.5	na		na	30.9	-49.2
Israel	2.8	Q4	5.6	3.0	5.2	Feb	3.4	4.3	Jan	4.0	-2.3	3.7		158	3.63	-9.6
Saudi Arabia	8.7	2022	na	2.8	3.0	Feb	2.2	5.8	Q3	6.5	1.6	na		na	3.76	-0.3
South Africa	0.9	Q4	-4.9	1.3	7.2	Jan	5.1	32.7	Q4§	-1.9	-4.8	10.1		25.0	18.4	-18.0

Source: Haver Analytics. *% change on previous quarter, annual rate. †The Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. †††Dollar-denominated bonds.

Markets

In local currency	Index Mar 15th	% change on: one week	% change on: Dec 30th 2022
United States S&P 500	3,891.9	-2.5	1.4
United States NAScomp	11,434.1	-1.2	9.2
China Shanghai Comp	3,263.3	-0.6	5.6
China Shenzhen Comp	2,081.3	-1.6	5.3
Japan Nikkei 225	27,229.5	-4.3	4.3
Japan Topix	1,960.1	-4.4	3.6
Britain FTSE 100	7,344.5	-7.4	-1.4
Canada S&P TSX	19,378.8	-4.8	nil
Euro area EURO STOXX 50	4,034.9	-5.9	6.4
France CAC 40	6,885.7	-6.0	6.4
Germany DAX*	14,735.3	-5.7	5.8
Italy FTSE/MIB	25,565.8	-8.4	7.8
Netherlands AEX	716.5	-4.9	4.0
Spain IBEX 35	8,759.1	-7.5	6.4
Poland WIG	56,844.1	-7.0	-1.1
Russia RTS, $ terms	937.0	-1.5	-3.5
Switzerland SMI	10,516.4	-4.6	-2.0
Turkey BIST	5,121.6	-5.8	-7.0
Australia All Ord.	7,263.1	-3.2	0.6
Hong Kong Hang Seng	19,539.9	-2.6	-1.2
India BSE	57,555.9	-4.6	-5.4
Indonesia IDX	6,628.1	-2.2	-3.2
Malaysia KLSE	1,403.9	-3.5	-6.1

	index Mar 15th	% change on: one week	% change on: Dec 30th 2022
Pakistan KSE	41,874.0	1.2	3.6
Singapore STI	3,172.9	-1.7	-2.4
South Korea KOSPI	2,379.7	-2.1	6.4
Taiwan TWI	15,387.6	-2.7	8.8
Thailand SET	1,565.0	-3.0	-6.2
Argentina MERV	209,824.2	-16.4	3.8
Brazil BVSP*	102,675.4	-3.6	-6.4
Mexico IPC	52,085.6	-2.4	7.5
Egypt EGX 30	14,724.4	-9.8	0.9
Israel TA-125	1,711.4	-3.8	-5.0
Saudi Arabia Tadawul	10,048.5	-3.5	-4.7
South Africa JSE AS	72,895.6	-6.2	-0.2
World, dev'd MSCI	2,638.5	-3.2	1.4
Emerging markets MSCI	946.9	-3.2	-1.0

US corporate bonds, spread over Treasuries

Basis points	latest	Dec 30th 2022
Investment grade	162	154
High-yield	505	502

Sources: Refinitiv Datastream; Standard & Poor's Global Fixed Income Research. *Total return index.

Commodities

***The Economist* commodity-price index**

2015=100	Mar 7th	Mar 14th*	% change on month	% change on year
Dollar Index				
All Items	157.7	157.6	-0.8	-17.5
Food	142.6	139.6	-3.6	-16.4
Industrials				
All	171.7	174.4	1.4	-18.3
Non-food agriculturals	124.3	121.9	-3.9	-36.3
Metals	185.8	190.0	2.5	-13.6
Sterling Index				
All items	202.7	198.0	-0.7	-11.2
Euro Index				
All items	165.2	163.0	-0.8	-15.6
Gold				
$ per oz	1,819.4	1,904.2	2.9	-1.1
Brent				
$ per barrel	83.4	77.5	-9.5	-21.9

Sources: Bloomberg; CME Group; Cotlook; Refinitiv Datastream; Fastmarkets; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Urner Barry; WSJ. *Provisional.

For more countries and additional data, visit
economist.com/economic-and-financial-indicators

Punching above their weight

Upper legislative houses tend to be politically biased and malapportioned

Left-of-centre Americans often bemoan their country's Senate, in which each state gets two seats regardless of population. This has always given the least populous states extra sway in the upper chamber of Congress. But in recent years, smaller states have become more Republican, and Democrats have called for reform.

Relative to parliaments elected by proportional representation, a method that matches shares of seats and votes, America's Congress looks badly malapportioned. But many countries, seeking to ensure that regional interests are heard, use systems that represent both places and people. And according to a new working paper by Pablo Beramendi, Carles Boix, Marc Guinjoan and Melissa Rogers, all political scientists, imbalances like America's are common in countries with bicameral legislatures.

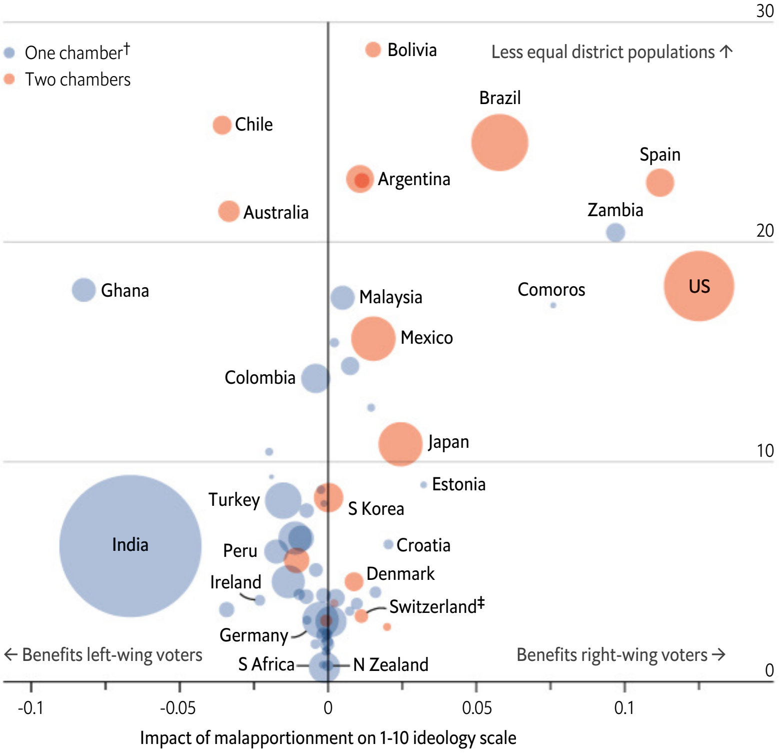
The authors measured malapportionment, defined as the gap between districts' shares of seats and eligible voters, in 247 elections across 65 countries. Just like the United States, the worst offenders, mainly in South America, give each state or province equal weight in the upper house. But the difference in voting-age population between Brazil's largest and smallest states—São Paulo has 99 times as many eligible voters as Roraima, in the Amazon—is even bigger than the 55-fold ratio of California to Wyoming. Unicameral legislatures in African countries like Ghana and Zambia, which do not balance constituencies by population, were also highly skewed.

The conservative bias of America's Senate also reflects a trend. Combining four sets of ideology scores for political parties, the authors assessed how much malapportionment favoured the left or right in each country. In general, right-leaning voters had disproportionate sway in upper houses, albeit with exceptions like Australia's and Chile's. In contrast, lower houses, in which seats and votes were better-aligned, were not skewed on average. Malapportionment in lower houses helped the left in some countries, such as India, Ireland and Peru, and the right in others, like Spain.

The data yield two conclusions for reformers. Left-wing parties should be wary of systems with powerful upper houses. And some countries with mixed-member parliaments, like Germany, avoid malapportionment while still providing geographic representation. The interests of places and people need not be at odds. ■

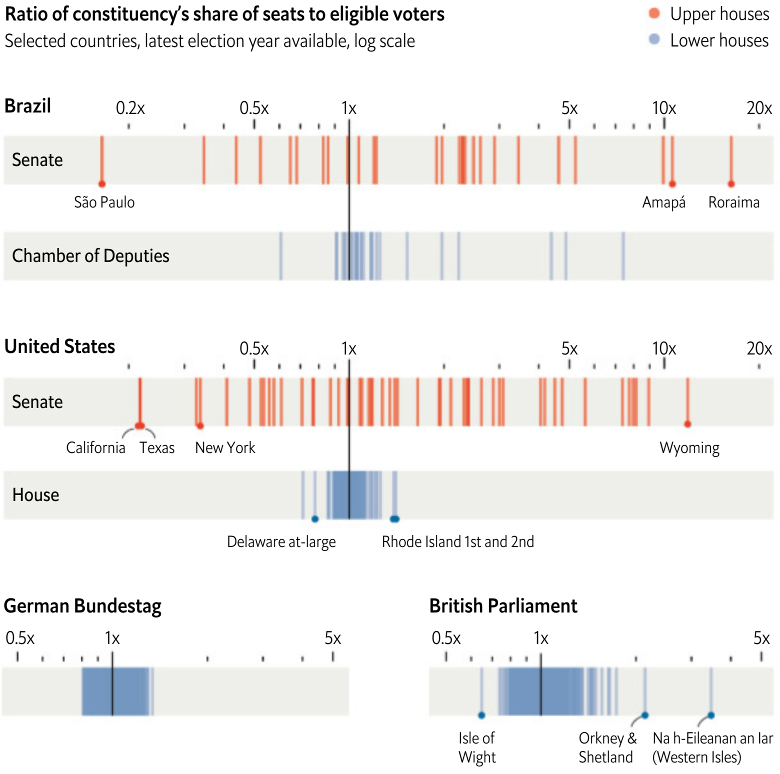
→ Conservatives tend to have an advantage in malapportioned legislatures

Share of seats that are malapportioned* by ideological bias, %
Average of upper and lower houses, latest election year available, size=population



→ Even in lower houses, districts can vary widely in size

Ratio of constituency's share of seats to eligible voters
Selected countries, latest election year available, log scale



*Seats that would be assigned to other districts using proportional representation †Includes bicameral systems lacking an elected upper house with geographic districts ‡No data for upper chamber Sources: "Distorted democracies", by Pablo Beramendi, Carles Boix, Marc Guinjoan and Melissa Rogers, working paper, 2023; World Bank

Father and son

Oe Kenzaburo, Nobel-winning writer and political activist, died on March 3rd, aged 88

The house where Oe Kenzaburo lived in Tokyo was a modest, tranquil place. Red maples and roses filled the garden, and paintings by his wife Yukari hung on the walls. The living room, crammed with books, was where he worked, sitting in an armchair to write in longhand on a board across his knees. But he was not alone. Also there was a man three decades younger, who sat sorting and re-sorting his collection of CDs and listening to music. He had a misshaped skull, a squint and a shy, sweet smile. His father kept an eye on him even as he wrote, ready to help at once, watchful for seizures. This was Hikari, his eldest son.

The birth of Hikari, in 1963, had been the greatest crisis in his life. He and Yukari were horrified at the sight of him, a baby with a cranial hernia so huge that he seemed to have two heads. Without an operation, the child would die. With one, he would still be profoundly handicapped. The dilemma was so acute that Kenzaburo could only run away, towards "some other horizon".

Oddly, perhaps, that horizon was Hiroshima, and a conference opposing nuclear weapons. There he met survivors of the atomic blast with dilemmas much like his own. Should they risk having children, if those children might be born deformed? Should they kill themselves, or try to live in hope? He spoke especially to doctors who did not know how, even whether, to treat people—but who had concluded that wherever there was pain, they should give care. There was his answer: he should take Hikari home.

That decision also shook up his writing. Fresh out of Tokyo University he had become a star—an unlikely one with his accent from a forest village far to the south-west, his jug ears and his owlish grin—by winning a national award for his novella "The Catch", the story of a friendship between a Japanese boy and a black American POW, "a splendid guest from the sky". But he had struggled since. In Hiroshima, he made two decisions: to write and campaign for the voiceless, and to speak uncomfortable things.

He faced his own dilemma by writing it down, as his method was, in three stories that branched out differently from the same point, a damaged child. In "A Personal Matter" and "The Silent Cry" the parents first abandoned the baby, then reclaimed it. In "Aghwee the Sky Monster", however, the father killed the baby by feeding it sugar-water rather than milk, and was haunted by the infant in its white hospital gown. Hikari featured in the novels under various names, and his own. This was not exploitation, his father insisted, but a recognition of what his voiceless child meant to him.

Too many voices were going unheard in Japan. Those from Hiroshima he recorded in "Hiroshima Notes", a scathing description of the effects of nuclear war. He made the point that these people were victims not just of the Americans, but of Japan's own aggressions in Asia. In essays and articles he spoke for the Korean minority, for forced labourers and "comfort women", and for proper reparation. He lamented, too, Japan's decline into consumerist conformity, a "happy wasteland" without controversialists. The 1950s had brought hopes of a new, pacifist role in the world, when Japan could have stood up with the weak. Yet it still saw itself as the forceful centre of Asia rather than, like him, making the most of a place on the periphery.

The revival of nationalism troubled him most. As a small schoolboy in the war he had pledged to obey the emperor unreservedly: if so ordered, "I would die, sir. I would cut open my belly and die." He was astonished to discover, when Japan surrendered, that the emperor was not some sort of mystical white bird; his voice was human. That quickly disabused him, but emperor-worship still persisted. Democracy needed defending, and he did so fulsomely in 1994 by declining the Order of Culture because the emperor bestowed it, and he rejected his authority.

Meanwhile the principle of eternal peace, the moral prop of Japan's post-war constitution, was threatened by the idea of collective self-defence. In 2004 he co-founded the Article 9 Association to resist all attempts to water down the peace clause and allow the use of force. By then he had been protesting against war for 40 years, marching abroad as well as in Japan. He was known for his gadfly activism as much as for his books, and relished that. He saw his job as that of a clown who spoke seriously, about sorrow.

His books, though, were also attacked by the right. These were tough, unflinching novels, heavily coloured by his reading of Rabelais, Yeats, Dante, Auden and Orwell. They writhed with seaminess, explicitness and grotesques, including a portrait of Japan as sexually humiliated by the United States. Their world was rough. In "The Silent Cry", the half-blind hero used his lost eye as a sentry "forever trained on the darkness within my skull, a darkness full of blood". Unsparingly, he described his alcoholic wife, "her upper lip greasy with sweat", the reek of a dog's slobbering mouth, a decomposing corpse with "the dam of the skin sentenced to burst". Yet the book also followed the hero's ascent from a cesspit of despair to a moment of brotherly reconciliation and, at the end, to "Expectation". It was themes of hope like this, passing from the personal to the universal, that led Mr Oe in 1994 to the Nobel prize.

Not the least of his acts of defiance was to bring Hikari up publicly. Brain-damaged children in Japan were usually shut away. But the bond between him and his son grew ever-closer. In his childhood in the forest, his mind full of the adventures of Huckleberry Finn and Nils Holgersson, the boy who flew with wild geese, he slept out among the trees and dreamed of knowing the language of the birds. When Hikari too was in the woods, aged six, he spoke his first sentence, identifying a water-rail. From that point the "monster-baby" came to know birds by their songs, to take in the music of Mozart and Bach, and to compose his own. He fulfilled his father's dreams; and he proved that music healed "the voice of a crying and dark soul", as his father hoped that words could.

In the living room in Tokyo they worked in the same space, separate but ever mindful of each other, looking, as he put it, "in the same direction". Hikari's name meant "light". ■

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